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No. 46

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INNOVATIONS IN ANIMAL HUSBANDRY

Yerevan KOMMUNIST in Russian 28 Jul 83 p 1

[Article by V. Zakharyan: "Making a Herd to Order"]

[Text] The Burastan sovkhos specializes in the production of meat. Significant successes in this area have already been achieved: the average weight per head of cattle at the end of the fattening period is 450 kg. This is the best indicator in Artashatskiy rayon and one of the highest in the republic.

This is quite an expensive accomplishment for the farm, however, since it takes approximately two years, and a considerable quantity of feed and manpower.

Why is the fattening period so long? In the first place, the herd is composed primarily of local breeds that do not have a high level of meat productivity. Estimates have shown that changing the herd through planned, selective breeding would require immense material expenditures and a great deal of time. Here science has offered a more efficient and promising method--embryo transplants.

The essence of this method can be described briefly as follows. A group of donor cows is selected from the population of highly productive, elite cows; they are given hormonal stimulation. This promotes the formation of not one, as is the norm, but three or even four embryos. Then with the help of catheters the embryos are removed from the womb and their viability is determined.

There are two variations for the next stage: the "pedigreed" embryos that have been obtained are transplanted into non-pedigreed recipient cows that will bear the offspring, and serve as "living incubators". The other choice is to freeze the embryos in a specially designed freezer for future use.

What are the benefits of this method? In the first place, one cow is not up to carrying and bearing four calves, so three embryos are already doomed to die. Transplanting the embryos to three other cows provides strong, healthy, pure-strain offspring.

The primary advantage of this method, however, is that extraction of the embryo and its subsequent storage opens up broad prospects for accelerating the reproduction of highly valuable breeds.

This kind of work is not a thing of the distant future. It has already been started at the Burastan sovkhos in its recently formed production laboratory for reproduction of agricultural animals using embryo transplantation methods. The Moscow State University Embryology Department (Professor K. G. Gdzaryan, chief) is providing scientific guidance for the program. The laboratory is headed by Avetik Shakhbazyan, candidate of biological sciences. He is a man totally engrossed in his work, who firmly believes that embryo transplants will play a decisive role in selection.

The laboratory's staff is not large. The entire staff as of now consists of Aleksandr Krivokharchenko, senior engineer; Armine Oganessian, engineer; and Valentina Surnova, laboratory assistant. But this is a collective of people who share the same ideas; they are enthusiastic about their work, and are essentially the pioneers of this vital work in Armenia.

The Artashatskiy rayon party committee is providing the laboratory staff with a great deal of help and all-around support.

The laboratory already has a fairly good material and technical base, and it has been supplied with modern equipment. It even has its own private farm. But it also has its problems. There is a shortage of hormones and of the special substance used to clean out the catheters. The laboratory needs effective help from academic institutes--biochemistry, experimental biology, fine organic chemistry, and other institutes.

Soon the laboratory will begin its first practical operations. Already 50 donors of the valuable French "Charolais" breed have been obtained; after the fattening period they can reach a weight of 1000 kg.

A. Shakhbazyan said, "Time will tell if we can succeed in preserving this 'ceiling' of productivity in the next generation obtained through embryo transplantation. There is no doubt that the change in location, the living conditions, and the feed rations will have an effect on the breed qualities. But we can already say with confidence that the productivity of our 'new residents' will be significantly higher than the average sovkhos indicator. And this is really what we are working for."

Thus, the embryo transplant method is in its first stage in our republic; this is a method that allows us to program the composition of future herds, and to shape them according to the demands of the national economy. This means that a reliable resource for increasing the efficiency of animal husbandry will be put into operation.

1970  
11/10/70

## BIOCHEMISTRY

### STUDY OF INTERACTION OF ANTIBODIES IMMOBILIZED ON SILOCHROME WITH ANTIGEN-ENZYMES CONJUGATE

Moscow BIOKHIMIYA in Russian Vol 48, No 4, Apr 83 (manuscript received 13 Jul 81)  
pp 691-699

POPOVA, N. N., GAVRILOVA, Ye. M., IARBUZIN, V. S., DZANTIYEV, B. B.,  
GROMOV, A. I. and YEGOROV, A. M., Department of Chemistry, Moscow State  
University imeni M. V. Lomonosov

[Abstract] The authors cite recent great interest in the study of the interaction of immobilized antibodies with antigens. This article continues the authors' study of the interaction of immunoperoxidase conjugates with immobilized antibodies based on a kinetic model according to which the population of immobilized antibodies is looked upon as two types of bonding centers with different equilibrium constants, the IgG conjugate - peroxidase - as a molecule having several independent complex formation centers on its surface. Computer processing of experimental data within the framework of this model produces a more complete description of the properties of the immobilized antibodies than previous methods. The method of processing experimental data studied--based on the kinetic model describing the interaction of the IgG-peroxidase conjugate with the immobilized antibodies as bonding of a single-valent antigen with two populations of active centers--determines the effective physical-chemical parameters of the reaction: the equilibrium constants of the high and low affine fractions of the antibodies, the rate constants of the forward and reverse reactions. It allows calculation of the general concentration of bonding centers and the percentage of high-affine antibodies. The data indicate the possibility of using silochrome as a carrier for development of high sensitivity solid phase methods of immunochemical analysis. Figures 3; references 10: 4 Russian, 6 Western.  
[679-6508]

## STUDY OF STABILITY OF IMMOBILIZED HIGH POLYMER RNA AND ITS APPLICATION TO HYBRIDIZATION

Moscow BIOKHIMIYA in Russian Vol 48, No 2, Feb 83  
(manuscript received 19 Feb 82) pp 292-296

ZEROV, Yu. P., AVER'YANOV, A. V., KOZLOV, K. A. and CHESNOKOVA, L. S.,  
All-Union Scientific Research Institute of Very High Purity Biological  
Preparations, Leningrad

[Abstract] A study was made of the effectiveness of immobilization by oxidation of RNA 3'-hydroxyl with periodate and condensation of the aldehyde group formed with an amino group of the solid carrier, as it applies to the high-polymer RNA of yeasts and the stability of immobilized RNA during the course of incubation under conditions of hybridization of nucleic acids. Preparations of *S. cerevisiae* total RNA were produced by phenol extraction at 65° in the presence of 1% DS-Na after mechanical disintegration of the cells. RNA was immobilized on CNBr-activated sepharose 4B and chromosorb. <sup>125</sup>I-labeled fragmented denatured yeast DNA with immobilized RNA was hybridized under conditions described for hybridization on nitrocellulose membrane filters. The main cause of splitting of RNA from the carrier was found to be hydrolysis by traces of RNAase in the incubation mixture. Protection from RNAase by means of pronase P assures good stability of the RNA on the carrier during incubation. The fraction of bound RNA in this case is about 50%, allowing immobilized RNA to be used for analysis of the composition of the DNA or separation of the DNA fraction complementary to the class of RNA being determined. References 18: 11 Russian, 7 Western.  
[680-6508]

UDC 616-006

## CHEMICAL BIONICS--NEW PRINCIPLE OF SYNTHESIS OF CONJUGATED ANTIGENS FOR PRODUCTION OF ANTIBODIES TO LOW MOLECULAR WEIGHT CHEMICAL COMPOUNDS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 271, No 2, Jul 83  
(manuscript received 17 Jan 83) pp 473-477

POLEVAYA, O. Yu., KOVALEV, I. Ye. and PRIUZYAN, L. A., corresponding member  
of the USSR Academy of Sciences, Scientific Research Institute for Biological  
Testing of Chemical Compounds, Kupavna, Moscow oblast

[Abstract] The purposes of this study were: 1) analysis and systematization of means for metabolic enzymatic activation of low molecular chemical compounds in the organism; 2) use of enzymes for the synthesis of conjugated antigens; 3) development of new methods for synthesis of conjugated antigens based on the principle of chemical modeling of enzymatic reactions of biotransformation of low molecular chemical compounds to reactive metabolites. Analysis and systematization of data from the literature on metabolic activation of various



low molecular weight chemical compounds served as a stimulus for the performance of experimental studies directed toward the use of enzymes for expedient synthesis of conjugated antigens. This approach is illustrated experimentally on examples in which the enzymes used were cytochrome P-450-containing microsomal animal liver fractions, while the heptenes used were polycyclic aromatic hydrocarbons such as benzo[a]pyrene and 3-methylcholanthrene and aromatic amines such as o-aminobenzotoluene and benzidine. The antigen carriers were serum albumins. Reactions were performed by incubating the initial components in neutral media at 25°C. Gel filtration on sephadex columns were used to separate the corresponding conjugated antigens. It was established that enzymes can be used to produce conjugated antigens for induction of highly specific antibodies to low molecular weight compounds. The studies provide a basis for development and application of the principles of chemical bionics for the synthesis of conjugated antibodies in the production of antibodies to low molecular weight chemical compounds. References 10: 9 Russian, 1 Western. [708-6508]

UDC 577.153

#### THERMOSTABILITY OF BRAIN $\text{Na}^+, \text{K}^+$ -ATPase IN PRESENCE OF SURFACTANTS

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 55, No 4, Jul-Aug 83  
(manuscript received 10 Oct 82) pp 392-397

KRAYTSOVA, V. V., KRAYTSOV, A. V. and YAROSHENKO, N. A., Institute of Biochemistry imeni A. V. Palladin, Ukrainian SSR Academy of Sciences; Institute of Colloid Chemistry and Water Chemistry imeni A. V. Dumanskiy, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] The effect of surfactants (alkyl)sulfates with a  $\text{C}_8\text{-C}_{15}$  carbon radical, deoxycholate, Triton X-100, Tween-80 and digitonin) on resistance of  $\text{Na}^+, \text{K}^+$ -ATPase--obtained from a bovine brain microsomal fraction--to heat inactivation was studied. Membrane-bound  $\text{Na}^+, \text{K}^+$ -ATPase was rapidly inactivated at 40-50°C, but preliminary incubation with Mg, K and especially Na markedly increased thermostability. Most surfactants reduced the half-life of the enzyme at 50°C and lowered its activity somewhat in the microsomal fraction not treated with NaCl. The effect of alkyl sulfates on enzyme thermostability depended on the length of the carbon chain. Pretreatment of the enzyme with NaCl increased its half-life in the presence of surfactants (exceptions were octyl- and dodecylsulfates) and resulted in the retention of enzyme activity (70-100%) in the presence of most surfactants except alkyl sulfates and deoxycholate. Triton X-100 had a "harsher" effect on ATPase at 50°C in the presence of Na than other surfactants with a similar chemical structure. There was an inverse relationship between the stabilizing effect of surfactants and their capacity to extract proteins and phospholipids from the enzyme preparation. Surfactants extracting more protein and lipids in the presence of  $\text{Na}^+$  generally inactivated or markedly reduced enzyme activity, whereas those extracting less protein and lipid in the presence of  $\text{Na}^+$  minimally reduced or did not alter



enzyme activity. Because the effect of surfactants varies with their chemical structure and factors such as temperature and ions, their action should be studied in each specific application of "detergent" techniques. Figure 1; references 21: 3 Russian, 18 Western.  
[587-9307]

## BIOPHYSICS

### INTERACTION OF ACETYLCHOLINE AND TUBOCURARINE WITH ACTIN COMPLEX PROTEIN MOLECULES AND PHOSPHATIDYLCHOLINE

Moscow BIOFIZIKA in Russian Vol 28, No 4, Jul-Aug 83  
(manuscript received 14 Apr 82) pp 625-628

YEGIAZAROVA, A. K. and NADAREISHVILI, K. Sh., Institute of Physiology  
Imeni I. S. Beritashvili, Georgian SSR Academy of Sciences, Tbilisi

[Abstract] A study is presented of the influence of acetylcholine and tubocurarine on the properties of monolayers of proteins and lipids, as well as the protein-lipid interaction. Monolayers of proteins and lipids were formed on the surface of KCl solutions with the subphase temperature maintained constant at 18°C. Tubocurarine and acetylcholine were used as chlorides. Actin and myosin were extracted from transversely banded rabbit muscles. Control experiments were performed without acetylcholine or tubocurarine. In the experiments after an equilibrium was established of the lipid molecule monolayer, protein was added in 6 portions to the subphase, each time measuring the maximum increase in lipid monolayer pressure resulting from adsorption or penetration of nonpolar aminoacid groups of the side chains of the protein. A total of 0.060 mg of protein was used. The method of least squares was used to determine the variation in change of surface pressure as a function of the logarithm of protein used, which was then used to calculate the influence of acetylcholine and tubocurarine on the capability of protein molecules to penetrate into the lipid monolayer. Only muscle protein and phosphatidylcholine actively interacted with acetylcholine and tubocurarine in the experiments. It is concluded that actin-like and myosin-like proteins and phosphatidylcholine may play an important role in the reaction of the cell to the effect of physiologically-active substances. References 15: 8 Russian, 7 Western.  
[622-6268]

## PROBLEMS IN MEDICAL BIOPHYSICS

Moscow PRIRODA in Russian No 5, May 83 pp 33-41

[Abstract] The article presents the text of an interview by N. D. Morozova, a PRIRODA reporter, with Lev Aramovich Piruzyan, a corresponding member of the USSR Academy of Sciences; director of the Scientific Research Institute of Chemical Compounds, USSR Academy of Sciences, and of the USSR Ministry of Medical Industry; and head of the Division of Medical Biophysics at the Institute of Chemical Physics, USSR Academy of Sciences. The interview was conducted after the session on medical biophysics, chaired by L. A. Piruzyan, at the First All-Union Conference on Biophysics held in Moscow in August 1982. Achievements in the new field of medical biophysics were the primary topic of discussion. Systemic lupus erythematosus was a typical example of the approach of medical biophysics to solving a medical problem. Research began with the discovery of the effect of light on the pathogenesis of this disease and ended with the development of a preparation "fogem," which acts as a light filter screening out rays (400 nm) responsible for the development of primary foci. In the area of medical diagnosis, study of the biophysics of blood coagulation led to the development of a procedure, based on the thermal properties of blood, for predicting coagulation pathologies. Computerized tomography and NMR are also mentioned as noninvasive diagnostic techniques. Piruzyan states that the development of "local magnetic resonance," similar to NMR spectroscopy but operating at room temperature, would make it possible to determine the concentration of organic substances and their structure and conformation and to control biochemical processes at any point in the body. The role of medical biophysics in analyzing the effect of harmful external factors, such as ionizing radiation and electromagnetic fields, on the human body and body resistance is also discussed. Another area of study has been the elaboration of a biological system for testing chemicals, including drugs and food additives, and the use of information banks to find compounds that may be likely candidates for testing for biological activity. The correlation between medical biophysics and fundamental concepts of living systems was illustrated with the examples of the self-organization of biological processes (e.g., electrical heart activity) and optical isomerism of biological molecules. Figures 3; references 5 (Russian).

[593-9307]

## ENVIRONMENT

UDC: 614.71:543.8:543.544

### GAS CHROMATOGRAPHIC DETERMINATION OF ORGANIC ACIDS IN THE ATMOSPHERE

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 83  
(manuscript received 17 Jun 82) pp 41-42

DMITRIYEV, M. T. and KOLESNIKOV, G. M., Institute of General and Communal Hygiene imeni A. N. Sytin, USSR Academy of Medical Sciences, Moscow

[Abstract] The authors have developed an effective gas chromatographic method for determining acetic, propionic, butyric, isobutyric, valeric, isovaleric and caproic acids in the air in a single-stage process. The method is based on collecting samples of air in water with subsequent chromatography of the carboxylic acids dissolved in the water. When a type LKhM-8MD gas chromatograph is used, the sensitivity of determination of organic acids is 1-5 ng. The minimum concentrations of fatty acids in the air which can be determined amount to 0.007-0.01 mg/m<sup>3</sup>, accuracy of analysis  $\pm 5\%$ . The method developed was used to study the contamination of the air around a cellulose plant. References 7: 6 Russian, 1 Western.  
[676-6508]

UDC 613.648:621.31]:614.777

### MONITORING ENTRY OF RADIONUCLIDES FROM OPERATING NUCLEAR POWER STATIONS INTO A WATER SYSTEM

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 83  
(manuscript received 7 Jan 82) pp 38-41

VINTEUKOVICH, N. V. and TOMILIN, Yu. A., Nikolayev Oblast Sanitary and Epidemiologic Station

[Abstract] Monitoring studies were conducted on the radionuclides (<sup>90</sup>Sr, <sup>137</sup>Cs, <sup>226</sup>Ra) in the effluent of the South Ukrainian Nuclear Power Station which is equipped with a circulating direct-flow cooling system. The discharge is made into the South Bug river in the proximity of the Konstantinovka and Aleksandrovka reservoirs. Analysis of the counts showed that the radionuclide content in the sediment and aquatic plants in the lower reaches of the South Bug river between Nikolayev and Novaya Odessa is 2-4 times greater than at the

area of discharge. This fact was attributed to the slower flow of water in that region and represents a special concern because this area serves as a source of water for irrigation and other agricultural uses and is an area of intense commercial and recreational fishing. These findings point to the need for monitoring water quality at some distances from the source of discharge (130 km) rather than limiting such control to the vicinity of a nuclear power plant (ca. 30 km). A schematic map of the river and locales involved is presented. Figures 1.  
[722-12172]

UDC 613.648:621.311(048.8)

#### ENVIRONMENTAL TRITIUM IN VICINITY OF NUCLEAR FUEL PLANTS

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 83  
(manuscript received 29 Jul 82) pp 62-65

TELUSHKINA, Ye. L.

[Abstract] A report is presented of the experience of several countries with environmental tritium in the vicinity of plants using, generating, or processing nuclear fuel. The danger that such environmental pollution may present is not overlooked, although the best estimates are that individuals living in proximity of such plants are not exposed to more than 1-10 mrem per year, i.e., significantly below the maximum allowable level. Nevertheless, in view of the development of various nuclear power plants and other facilities relying on nuclear fuel the human dosage from this radionuclide will show a continuous increase. These facts underscore the urgent need for means to regulate the environmental level of tritium and limit its discharge into the biosphere. References 7: 1 Russian, 6 Western.  
[722-12172]

UDC 577.4

#### ANTHROPOGENIC CHANGE IN PROTEIN COMPOSITION OF MARINE ORGANISMS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 271, No 2, Jul 83  
(manuscript received 31 Jan 83) pp 502-505

RUDNEVA, I. I., Institute of Biology of the Southern Seas imeni  
A. O. Kovalevskiy, Ukrainian SSR Academy of Sciences, Sevastopol'

[Abstract] The purpose of this study was a comparative analysis of the protein composition of marine crustaceans *Gammarus marinogammarus olivii* inhabiting a clean area of the sea and a city effluent area. The *G. m. olivii* inhabiting an effluent-contaminated area manifested a decrease in the total number of fractions in EP [electrophoretic] spectra with a simultaneous

increase in the number of "rare" components. The differences were significant among females, insignificant among males. The studies allowed the protein composition of *G.m. olivii* to be determined. The results produced may indicate the modifying influence of waste water mutagens on the genetic apparatus of these hydrobionts. Changes in the protein composition of hydrobionts inhabiting polluted waters are suggested as a test to allow evaluation and prediction of the ecologic and genetic results of the influence of pollution on populations of marine organisms. Figure 1; references 11: 8 Russian, 3 Western.  
[708-6508]



UDC 614.777:628.191:578

IMPORTANT PROBLEMS IN CONTROL OF VIRAL CONTAMINATION OF WATER

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 83  
(manuscript received 10 Oct 82) pp 15-19

BAGDASARYAN, G. A., MYSHLYAYEVA, L. A. and DMITRIYEVA, R. A., Scientific  
Research Institute of General and Communal Hygiene imeni A. N. Sysin,  
USSR Academy of Medical Sciences, Moscow

[Abstract] A review is presented of the international literature dealing with contamination of water supply with various viruses and the means employed for their detection. Major emphasis in the review is placed on pollution with enteroviruses from human and animal excreta, although most public health measures are directed at the identification and removal of infectious hepatitis virus. Identification and isolation of the viruses often involves various methods of concentration, ultrafiltration, adsorption, and precipitation with salts. Studies are also being conducted on defining appropriate indicators, of which the coliphage is a leading candidate. References 50: 20 Russian, 30 Western.  
[722-12172]

UDC 613.2(477):[664.339]:008(47+57)

FOOD PROGRAM AND TASKS OF UKRAINIAN NUTRITIONAL HYGIENISTS

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 83  
(manuscript received 12 Jul 82) pp 22-25

MAYSTRUK, P. N. and GABOVICH, R. D., Kiev Scientific Research Institute  
of Nutritional Hygiene

[Abstract] The authors' institute has studied the actual nutrition of various occupational and age contingents in the five major climatogeographic zones of the USSR. These studies, involving more than 30,000 persons, have revealed significant changes in the nutrition of the residents of the Ukraine. Qualitative structure has generally improved, the consumption of biologically valuable animal husbandry products, fish, vegetables and fruit has increased by 40 to 350% for various products, with a corresponding decrease in the consumption of grains (by 30%). However, some changes are still needed. Calorie intake should be reduced and the consumption of less fatty but biologically valuable products such as vegetables, fruits, whole wheat flour products, trace elements, pectin, etc., should be increased. Sanitary education work among the population on questions of proper diet and avoidance of fats should be increased. The Institute is also performing studies to help reduce contamination of food products with harmful chemicals. Hygienists are called upon to respond in a creative and timely manner to the challenges set forth by the May Plenary session of the CC CPSU.  
[676-6508]

UDC 658.387+664.8.001.5.06.053

STRENGTHENING BONDS BETWEEN SCIENCE AND PRODUCTION AND INCREASING  
EFFECTIVENESS OF RESEARCH

Moscow KONSERVNAYA I OVOSHCHESUSHIL'NAYA PROMYSHLENNOST' in Russian No 8,  
Aug 83 pp 44-46

KARAPET'YAN, M. V.

[Abstract] An all-Union meeting was held in May 1983 by heads of the various departments of the USSR Ministry of Food Production and the heads of various research and industrial enterprises to assess the progress made in meeting the

directivities of the May and November (1932) Plenums of the Central Committee of the Communist Party of the Soviet Union regarding food production and food research. The five major areas of discussion included implementation of research findings in industry, expansion of the research base, establishment of research policy and directions, improvements in the administrative structure, and economic incentives and innovations in planning. Considerable progress has been made in expanding the line of available food products and their quality. However, some industrial enterprises are still slow in availing themselves of new technology and in making the best use of available resources. In concluding the meeting, resolutions were passed calling for determination and sacrifices necessary to meet the requirements of the USSR Food Program and bring the 11th Five Year Plan to a successful conclusion in this regard. [706-12172]

UDC 658.562:664.8.036.72

#### METROLOGIC SUPPORT OF ACCEPTANCE TESTING OF GLASS CONTAINERS

Moscow KONSERVNAYA I O'SHCHESUSHIL'NAYA PROMYSHLENNOST' in Russian  
No 7, Jul 83 pp 13-14

KOSOY, Ye. I., Chief, Metrology Sector, All-Union Scientific and Production-Design Institute "Konservpromkompleks"

[Abstract] Some 25% of the glass containers which break at canning plants break during filling and capping. One of the main reasons causing this excess breakage is failure of the glasses to meet the requirements of the state standard for glass containers, types and dimensions. In spite of the provisions for penalizing glass-container plants which manufacture containers not meeting the standards, canning plants almost never file formal complaints concerning delivery of defective glassware. This is largely because of the lack of accurate and convenient measurement devices to be used by canning plants in acceptance-testing of glass containers. In 1983-1984, special gages are to be manufactured to test the diameter of the throat of glass jars, and the height and diameter of the cylindrical portion of the jars. Instruments are also to be developed for testing the wall thickness and estimating parallelism of the ends of containers, bottom flatness and noncoaxiality of throat and cylindrical portions of containers.

[712-6508]

## PRODUCTION OF HIGH QUALITY PRODUCTS--A TASK OF PRIMARY IMPORTANCE

Moscow KONSERVNAYA I OVOSHCHESUSHIL'NAYA PROMYSHLENNOST' in Russian  
No 7, Jul 83, p 20

SHEVCHENKO, L. I., head engineer-technologist, Administration for Processing,  
Ministry of Fruit and Vegetable Growing, Estonian SSR

[Abstract] The production of canned fruits and vegetables in the Estonian SSR is concentrated at the Tartu Canning Plant and three processing shops at farms in the republic. In spite of the unfavorable weather conditions of the 1981/82 season, the plan for production of canned fruits and vegetables for the first two years of the Five-Year Plan was fulfilled. The assortment available is broad and has allowed elimination of the seasonal nature of production, increasing the use of plant capacity to 95%. Children's canned food has been highly evaluated at the exhibition of achievements of the USSR economy. However, due to limitations on the resources of legumes and berries and the unavailability of sulfated fruit-berry pulp since 1981, the number of products has been reduced. Most fruits and vegetables and all berries canned are purchased from the population. Preparations have been completed for the 1983 season. Steps which are to be taken to increase the productivity of labor and improve technological processes are mentioned. The availability of the raw material resources indicates that the plan for production will be successfully fulfilled while assuring high quality products.

[712-6508]

UDC 613.2+612.39]:001.8[664:339]:008(47+57)

## NUTRITION SCIENCE IN IMPLEMENTATION OF USSR FOOD PROGRAM

Moscow VOPROSY PITANIYA in Russian No 2, Mar-Apr 83  
(manuscript received 5 Oct 82) pp 3-5

Unsigned

[Abstract] Mechanization and automation of labor in the USSR has resulted in a decrease in the number of calories per day required by the population. This has resulted in refinements being made to the USSR Food Program in consideration of the decreased requirements for calories. Throughout the world and in the USSR the consumption of sufficient quantities of full-valued animal protein continues to be a problem. Therefore, the forces of Soviet nutritionists have been directed toward seeking new sources and maximum utilization of traditional sources of food protein. Recent research has established that the traditional technology for processing of food products both at home and particularly at food plants significantly reduces the nutritional and biological value of the food by breaking down many proteins, fats, carbohydrates and vitamins. New schemes of preparation of dishes and food products with maximum preservation of nutritional and biological value

have been developed, based primarily on reduction of the amount of heat imparted to the food products. The products of human activity contaminate the environment and find their way into food products. New standards documents have been developed for the classification of types of food poisoning and spoilage of perishable products.

[721-6508]

UDC 613.2([47+57]-17)(048.8)

#### HUMAN NUTRITION IN THE NORTH

Moscow VOPROSY PITANIYA in Russian No 2, Mar-Apr 83  
(manuscript received 5 Feb 82) pp 5-12

KONYSHIN, V. A., NESTERIN, M. F. and PANIN, L. Ye., Institute of Nutrition, USSR Academy of Medical Sciences, Moscow; Institute of Clinical and Experimental Medicine, Siberian Branch, USSR Academy of Medical Sciences, Novosibirsk

[Abstract] In spite of many studies in recent years, there is no generally accepted preferred diet for people residing in the far north. It has been suggested by some authors that the diet of natives in the area represents a successful adaptation to the climatic conditions. Typical far northern natives consume diets very rich in animal and fish protein and fat. However, other researchers have indicated that this diet has developed in response to the food available in the area rather than in response to the nutritional needs of the population. Recent studies indicate that the high protein, high fat diet of the area, in combination with the hypoxia resulting from high altitude conditions in the polar plateaus, may be harmful in terms of coronary heart disease. It has been determined that performance of the same work by persons residing in different environments causes an increase in the energy consumed with increasing distance from the equator. Energy consumption per day in the far north is approximately 50% greater than at the equator. The materials presented in this article show that the needs of the organism for energy in high latitudes have been well discussed and researchers are in general agreement on this increase in calorie consumption in the north. However, a number of problems have been little studied or remain unsettled, including the interrelationship of high calorie, high fat diets with increased risk factor for cardiovascular disease, determination of the optimal vitamin ration in the north, as well as determination of the requirements for trace elements and minerals, problems of preservation of the food value of products during long storage and determination of the role of nutrition in processes of adaptation to conditions in the north. References 88: 73 Russian, 15 Western.

[721-6508]



## OCCURRENCE, CAUSES AND PREVENTION OF IRON-DEFICIENT STATES

Moscow VOPROSY PITANIYA in Russian No 2, Mar-Apr 83  
(manuscript received 20 Sep 82) pp 12-16

NASOLODIN, V. V., Department of Physical Education, Yaroslavl University

[Abstract] The ecology of iron in the human body is discussed. Paths through which iron is lost are noted, standards for replacement consumption are mentioned and the fact that iron is more easily assimilated from meat than from vegetable food is noted. Factors which favor assimilation such as copper, amino acids, fructose, hydrochloric acid, animal protein, certain vitamins and particularly ascorbic acid are cited. The course of iron deficiency states is described. It is noted that there are problems with increasing iron nutrition by simply increasing iron intake, since a high-iron diet has been observed to decrease the transport, retention and assimilation of manganese and copper, necessary for hematopoiesis. Statistically reliable increases in iron concentration in the blood plasma are achieved by intake of iron in combination with copper and manganese, copper and cobalt, ascorbic acid, group B vitamins, amino acids and other associated substances.

References 83: 35 Russian, 48 Western.

[721-6508]

UDC 612.745.6-06:613.21

## SOME METABOLISM AND ENERGY INDICES WITH INADEQUATE NUTRITION

Moscow VOPROSY PITANIYA in Russian No 2, Mar-Apr 83  
(manuscript received 26 Oct 82) pp 27-30

D'YAKONOV, M. M. and KUDRIN, I. D., Leningrad

[Abstract] Ten physical education students 18 to 21 years of age took part in an experiment involving heavy physical exercise designed to consume 4500 to 8500 calories per day for a period of 8 days. The diet throughout the study consisted of natural foods with a total energy value of 3220 calories per day. Anthropometric measurements, strength testing, blood and urine analysis were accompanied by examination and interrogation of the subjects. The results showed that the inadequate nutrition was reflected in the status of anthropometric indices, including 5.3% weight loss, 23.9% fat loss and 3% muscle mass loss. In the first two to three days of the study, adaptation restructuring of metabolism occurred, resulting from changes in regulatory mechanisms related to the activity of the hormones, vitamins and trace elements and corresponding enzyme processes. The body's fat reserves were the main sources of energy during the study. Recovery of the normal metabolic status of the body required 3 to 5 days, less time in the subjects who were stronger and in better physical condition. The 8-day period of inadequate nutrition was found to be accompanied by high stress on nitrogen, lipid, carbohydrate, vitamin and mineral metabolism. References 15: 14 Russian, 1 Western.

[721-6508]



# ASSIMILATION OF FAT AND INDICES OF LIPID METABOLISM IN BLOOD SERUM OF PREMATURE INFANTS FED WITH MILK FORMULAS WITH VARIOUS FAT COMPOSITIONS

Moscow VOPROSY PITANIYA in Russian No 2, Mar-Apr 83  
(manuscript received 13 Jul 82) pp 35-38

LADODO, K. S., BARASHNEVA, S. M., SADYRBAYEVA, Z. S. and IVASHCHENKO, N. V.,  
Institute of Pediatrics, USSR Academy of Medical Sciences; Institute of  
Nutrition, USSR Academy of Medical Sciences, Moscow

[Abstract] Ninety premature infants with gestation age 33 to 37 weeks and body mass 1700 to 2500 g at birth were observed. All the infants were in satisfactory condition. Thirty were breast fed, the remainder received 4 different artificial formulas. Clinical observations continued for 4 to 6 weeks. The children tolerated all the formulas well and no reliable differences were found in weight gain. Mild allergic reactions were observed in children in all groups. The highest percentage of fat assimilation was observed in children receiving mother's milk. The results indicated that the formula closest in its effect on the children to mother's milk was Similac, allowing it to be recommended for feeding of premature children when necessary. Figures 3; references 18: 6 Russian, 12 Western.  
[721-6508]

UDC 613.22:613.268]-074

# METHOD OF QUANTITATIVE DETERMINATION OF VEGETABLE FATS IN 'MALYSH' AND 'MALYUTKA' INFANT FOOD PRODUCTS

Moscow VOPROSY PITANIYA in Russian No 2, Mar-Apr 83  
(manuscript received 15 Dec 81) pp 65-67

MERZAMETOV, M. M. and ANTOSHCHENKO, L. S., Department of Organic and Physical  
Colloid Chemistry (headed by Professor M. M. Merzametov) Dagestan  
University imeni V. I. Lenin, Makhachkala

[Abstract] A comparatively simple and precise method has been developed for quantitative determination of vegetable oils in the fat component of "Malysh" and "Malyutka" infant formula products. The method is justified by the fact that it has been proven to be possible to use the relationship between the saturation factor of a fat--i.e., the ratio of the change in the index of refraction of a fat before and after iodination--and the iodine number and also, the percentage content of vegetable oil in the mixture with milk fat. The saturation factor was determined for 10 specimens of milk, sunflower and corn oils; mathematical processing established the arithmetic mean, standard deviation and standard deviation of arithmetic mean at confidence level 68%. Production testing of the refractometric method of quantitative determination of nonmilk fat in children's formulas showed that the relative error is not over 2.5%. The method is recommended for quantitative determination of

vegetable oils and mixtures with milk fats in the production of children's formulas. The method is simple and inexpensive, requiring no expensive reagents or equipment or extensive training of workers. Figure 1; references 12: 6 Russian, 6 Western.  
[721-6508]

## GENETICS

### SOVIET ADVANCES IN GENETIC STUDY CITED

Moscow IZVESTIYA in Russian 24 Aug 83 p 3

[Article by Academician Ye. Chazov: "The Secrets of Chromosomes"]

[Text] Man has always strived toward an understanding not only of the nature around him, but also toward an understanding of himself. Many centuries have passed since the leading minds, the trail-blazers of science, first began studying human anatomy and physiology and the processes of emergence and development of illnesses. Within these spheres it was possible to attain certain success quite rapidly, to clarify the reasons for numerous phenomena.

However, the knowledge of how various traits are passed down from generation to generation, of how and why a person inherits from his ancestors good health or, on the contrary, illness or pre-disposition to it, bore a descriptive character until the middle of this century. While properly noting some manifestation of heredity, scientists could not get down to its true reasons. It has only been in the last three decades, with the development of genetics, molecular biology and electron microscopy, with the utilization of all the achievements in physics and chemistry, that a real possibility of delving deeply into the nature of heredity has emerged.

The cherished dream of scientists -- to study the chromosomes, these material bearers of heredity -- has today become a reality. This dream was born not only of a desire to move ahead in learning the secrets of nature. Today doctors have been able to significantly reduce infectious diseases and infant mortality. However, a much greater "relative share" in the overall number of illnesses has fallen to serious ailments caused by chromosome changes.

For the last 20 years in our country, a group of leading medical geneticists -- USSR Academy of Medical Sciences Academician N. Bochkov, USSR Academy of Medical Sciences corresponding members Ye. Davidenkova, A. Zakharov, A. Prokof'yeva-Bel'govskaya, and Professor Ye. Pogonyants -- have been studying the structure and function of chromosomes. The cycle of works, "Fundamental Research on Human Chromosomes in the Norm and in Pathology" is now being presented for USSR State Prize competition.

Step by step the scientists lifted the veil from the most minute cell structures

which regulated all the life functions. Numerous laboratory experiments and theoretical interpretation of the results made it possible to characterize in detail all the human chromosomes, each of which has a specific topography, or in other words "its own face." Similar works on the minute study of the structure and function of human chromosomes were also conducted abroad. However, the priority of the above-named Soviet scientists and the originality of their methods is irrefutable. This fact has been generally acknowledged by Soviet and foreign medical men and biologists.

The in-depth theoretical study of human chromosomes found broad practical application. New methods were created, called cytogenetic methods, with the aid of which it was possible to study many previously unstudied illnesses. Thanks to this, the diagnosis of illnesses became finer and more exact, particularly those forms of illnesses which are conditioned by insignificant disruptions in the structure of the chromosomes. A detailed description of each of them according to numerous traits made it possible to study different variations of the chromosome set in different people and to approach an understanding of the role of even insignificant individual deviations in the development of the illness.

Today precise cytogenetic methods have been introduced into practical health care. They are used in obstetrics and pediatrics, in oncological hospitals and medical-genetic consultations for diagnosing illnesses, health prognosis of off-spring, pre-natal diagnosis of chromosome deviations, and for prognosis of the course and evaluation of the effectiveness of treating certain forms of tumors and leukemia. With certain types of illnesses -- mental retardation, infertility, birth defects, and others -- cytogenetic methods make it possible to clarify the reason for the ailment most precisely.

The authors have studied the clinical peculiarities and mechanisms of development of a number of chromosome-related illnesses much more fully than has been done abroad. This has particularly shown the best traits of the Soviet clinical school -- careful analysis of the state of health of the patient and his family. The obtained data are helpful in developing better aimed methods of treatment.

The large volume of research and its particular thoroughness must be noted. The authors have taken on the task of studying the prevalence of chromosome-related illnesses in various cities and regions of the USSR. Approximately 100,000 children were studied. Moreover, data on several million newborns were analyzed. In some cities, the frequency of hereditary diseases was traced over a period of 20 years. It was found that chromosome pathology is often the cause of developmental birth defects and mortality in children at a very young age. The older the parents, the more frequent the chromosomal disruptions in their children. The clarification of the prevalence and frequency of chromosomal illnesses has made it possible to plan specialized medical aid to this group of severely ill persons.

The many years of extensive work on studying chromosomes and the fundamental scientific developments which are important for theoretical and clinical medicine are already today bringing great and discernible benefit to people.

Today an overall evaluation of the progress achieved in the field of human genetics would be unthinkable without these basic works. They are most deservedly presented for competition for the USSR State Prize.

12322

CSO: 1840/716

EFFECT OF ColIb-P9 PLASMID ON SURVIVAL RATE AFTER ULTRAVIOLET IRRADIATION AND MUTAGENESIS IN *umuC*, *uvr*, *recL*, *uvrE*, *tif1* *sfIA* *lexA* *spr*-MUTANTS OF *ESCHERICHIA COLI* K-12 CELLS

Moscow GENETIKA in Russian Vol 19, No 8, Aug 83  
(manuscript received 1 Dec 82) pp 1221-1226

KOPYLOV, V. M. and KEMEL', I. A., Institute of Molecular Genetics, USSR Academy of Sciences, Moscow

[Abstract] In previous works, the authors had demonstrated the influence of the ColIb-P9 plasmid on processes related to DNA repair in *E. coli* K-12 cells: cell survival after exposure to DNA-damaging agents, mutagenesis, colicine E1 synthesis induction and reactivation of an irradiated  $\lambda$  phage, demonstrating the strict variation in the effect of the plasmid as a function of the *recA* and *lexA* genes. The pKM101 plasmid has a similar effect, indicating a similar mechanism of action. The pKM101 plasma suppresses the *umuC* mutation phenotype. This article presents the results of a study intended to determine whether the ColIb-P9 plasmid has a similar effect. The work also studies the effect of ColIb-P9 in cells with mutations in the *uvrD* gene. Although general similarity is observed in the effects of the two plasmids, there are some remaining differences. For example, the plasmids have opposite effects on survival rate, and the induction of colicine E1 synthesis, when cells are treated with mitomycin C. ColIb-P9 plasmid fully restored UV mutability and the survival rate of cells which were mutant for the *umuC* gene. The ColIb-P9 plasmid apparently codes a product similar to the product of the *umuC* chromosomal gene. Its effect apparently occurs after the stage of depression of the *recA* gene in *recA*<sup>+</sup> *lexA*<sup>+</sup> dependent DNA repair processes. Figure 1; references 23: 6 Russian, 17 Western.  
[711-6368]



BIOCHEMICAL POLYMORPHOUS SYSTEMS IN POPULATION OF IMMIGRANTS TO NORTHEASTERN USSR. REPORT 1. GENETIC STRUCTURE AND ITS HETEROGENEITY RESULTING FROM SEXUAL DIMORPHISM AND LENGTH OF RESIDENCE OF INDIVIDUAL GROUPS UNDER EXTREME ENVIRONMENTAL CONDITIONS

Moscow GENETIKA in Russian Vol 19, No 8, Aug 83

(manuscript received 13 Apr 82; in final form 22 Sep 82) pp 1327-1334

SOLOVENCHUK, L. L., Institute of Biological Problems of the North, Far Eastern Scientific Center, USSR Academy of Sciences, Magadan

[Abstract] The authors had demonstrated in a previous report that the frequency of phenotypes for certain polymorphous locuses can be associated with the time of residence in regions with severe climatic characteristics, the association being formed by selective migrational behavior for specific locations. A significant enlargement of the sample and expansion of the range of polymorphous systems involved have now allowed refinement and significant supplementation of the possible ecologic determination of changes in phenotype and gene frequencies in the immigrant population of the northeastern USSR. The data indicate that the genetic structure of the immigrant population of the northeast differs from that of Moscow residents, and that the frequency of phenotypes and genes differs significantly in males and females. Selective immigration or reimmigration could explain the difference in this population. The data make it clear that the differences in phenotype frequencies in representatives of the two sexes result from differences in changes in genetic structure as a function of time of residence in the region. The significantly lower rate of migration among females in comparison to males leads to a significantly lower rate of variation in their genetic structure. References 16: 13 Russian, 3 Western.  
[711-6508]

BIOCHEMICAL POLYMORPHOUS SYSTEMS IN THE POPULATION OF IMMIGRANTS TO THE NORTHEASTERN USSR. REPORT 2. GENOTYPE 'DISTANCES' BETWEEN GROUPS OF HEALTHY PERSONS WITH DIFFERENT LENGTHS OF RESIDENCE UNDER EXTREME ENVIRONMENTAL CONDITIONS

Moscow GENETIKA in Russian Vol 19, No 8, Aug 83

(manuscript received 13 Apr 82; final version received 22 Sep 82) pp 1335-1343

SOLOVENCHUK, L. L., Institute of Biological Problems of the North, Far Eastern Scientific Center, USSR Academy of Sciences, Magadan

[Abstract] A qualitative evaluation is presented of genetic differences in groups of immigrants who had lived in the northeastern USSR for varying periods of time. Differences between representatives of the two sexes by groups are analyzed and each group is compared with the population of Moscow and of

Chukotka. Analysis of difference between groups was based on the following polymorphous locuses: acid phosphatase of erythrocytes, phosphoglucosmutase, 6-phosphogluconate dehydrogenase, gluconate pyruvate transaminase, adenylate kinase, glyoxalase-1, alkaline serum phosphatase, haptoglobins, transferrins, the group-specific component and ABO and Rh blood group. Very little difference is found between the two sexes, but the results indicate that selective migratory behavior tends to produce a population of immigrants over time which is suited to the ecological conditions of the place of residence. Figure 1. references 9: 8 Russian, 1 Western.  
[711-6508]

UDC 575.591

MEDICO-GENETIC STUDY OF POPULATION OF TURKMENIA. REPORT 3. HEREDITARY PATHOLOGY AMONG TURKMENIAN RESIDENTS OF NOKHUR

Moscow GENETIKA in Russian Vol 19, No 8, Aug 83

(manuscript received 19 Apr 82; final version received 22 Sep 82) pp 1344-1351

GINTER, Ye. K., TURAYEVA, Sh. M., REVAZOV, A. A., PANTELEYEVA, O. A., ARITYKOV, A. and MIKHAYLOVA, L. K., Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow

[Abstract] Information is presented on the accumulation of a rare hereditary pathology in an isolated group discovered during medical-genetic studies in the population of Ashkhabad Oblast, Turkmenian SSR. The mountainous population of Nokhur located in Bakhardanaskly rayon of Ashkhabad Oblast is an interesting study population because of very little immigration and high inbreeding (at least 1-1.5%), making them an isolated population. Southern Turkmenian nomads, the Nokhur residents are a conglomeration of various ethnic groups accumulating over a number of centuries. Congenital cataract and obesity were observed in the population. A medical and genetic description of this isolate, a series of closely-related populations living in a number of villages in the region, is presented. The significant number of patients with autosomal recessive diseases results to a great extent from the significant inbreeding in the population, as well as the significant growth in numbers of the population observed over the past century. Figures 2; references 17: 10 Russian, 7 Western.  
[711-6508]

## VARIABILITY AND HEREDITARY CHARACTERISTICS OF NEURODYNAMIC AND PSYCHODYNAMIC PARAMETERS IN HUMAN POPULATIONS

Moscow GENETIKA in Russian Vol 19, No 8, Aug 83

(manuscript received 10 Mar 82; final form received 14 Oct 82) pp 1353-1363

DUBININ, N. P., BULAYEVA, K. B. and TRUBNIKOV, V. I., Institute of General Genetics, USSR Academy of Sciences, Moscow

[Abstract] A study of variability and heritability of neurodynamic and psychodynamic parameters indicates that individual psychological differences in this area are quantitative characteristics, the phenotypic variability of which is continuous. Determination of the genetic components and nongenetic factors causing the broad hereditary variability in this area are of equal importance. Their variability and heritability are population categories which depend on the genetic and social structure of specific populations. This study was based on isolates in Dagestan which were compared with the heterogeneous population of Moscow. Anomalies in color vision, taste and the perception of pure green tones were studied. An analysis of the components of the phenotype dispersion of the neurodynamic and psychodynamic parameters studied revealed no dominant component. The small size of the group of relatives examined prevented production of differentiated phenotype correlations among relatives by sex, which might allow producing a  $\lambda$ -chromosome component in the overall phenotype dispersion of each characteristic. The fraction of genetic variability of the different characteristics varied, being higher, the more elementary the characteristic in question. The results of the investigation indicate that the population-genetic approach to the study of genetic and social individual characteristics is promising. Figure 1; references 28: 20 Russian, 8 Western.  
[711-6508]

UDC 575.113:577.212.3]:001.8(47+57)

## PROGRESS IN THE SOVIET 'GENE' RESEARCH PROGRAM

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian No 3, May-Jun 83 pp 3-4

DEBOV, S. S., TIKHONENKO, T. I. and OSTROUMOVA, L. M.

[Abstract] In 1976 the Gene Program was established in the USSR to coordinate studies in genetic engineering and apply the findings to medicine and industrial microbiology. In 1981 the main emphasis of research was on the isolation and commercial production of enzymes important for genetic engineering, restrictional and functional analysis of the genomes of oncogenic DNA viruses and DNA genomes of RNA viruses, reverse transcription of genomes and individual genes or DNA copies of viral genes responsible for capsid proteins, creation of a variety of poly- and monovalent molecular and viral vectors for amplification of cloned genes, design of new vector systems and fungal recipients for expression of eukaryotic genes, and studies on individual genes that

may be defective and responsible for heritable diseases in humans. Many of the areas of research falling under this program are reported in the May-June 1983 issue of VOPROSY MEDITSINSKOY KHIMII (No 3).  
[719-12172]

UDC 579.252.55.083.138

#### NOVEL SYSTEM FOR SELECTION OF CRYPTIC PLASMIDS USING pMB1 REPLICON

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian No 3, May-Jun 83  
(manuscript received 27 Sep 82) pp 8-11

KALININ, V. N., OVECHKO, N. N. and GRANOVSKIY, N. N., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] The hybrid plasmid pGall, based on pMB1 replicon, is cytotoxic for host *E. coli* cells if present alone, but not in the presence of plasmid pMB9 which also contains the pMB1 replicon. The presence of pMB9 was shown to limit the number of pGall copies to one per bacterial chromosome. A pGal2 plasmid, derived by removal of a 1.1 mD DNA fragment from pGall, is not cytotoxic for *E. coli*. However, reinsertion of the 1.1 mD fragment into pGal2 imparts cytotoxicity and demonstrates that this DNA fragment which is flanked by two *EcoRI* sites, is responsible for cytotoxicity of pGall. Other hybrid plasmids based on the pMB1 replicon (p601 and p589) were also found effective in inhibiting cytotoxicity and in forming recombinant plasmids. Therefore, by inhibiting pGall cytotoxicity it is possible to obtain *E. coli* clones carrying cryptic plasmids constructed from the pMB1 replicon. Figures 1; references 7: 3 Russian, 4 Western.  
[719-12172]

UDC 578.826.7:578.233.42]:578.23:616-006-018.15:575.113

#### INTEGRATION OF FRAGMENTED DNA OF SIMIAN ADENOVIRUS SA7 IN GENOMES OF TRANSFORMED AND TUMOR CELLS

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian No 3, May-Jun 83  
(manuscript received 27 Sep 82) pp 14-22

CHAPLYGINA, N. M., GARTEL', A. L. PONOMAREVA, T. I. and TYUNNIKOV, G. I., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Hybridization on nitrocellulose filters using *SaII* restrictase for DNA fragmentation demonstrated that the DNA of the highly oncogenic simian adenovirus SA7 was incorporated into the genomes of transformed rat cells and tumor cells from hamsters with SA7-induced tumors. Integration of the SA7 DNA fragments did not involve deletions in the viral acid. The integrated viral DNA fragments were in close proximity to one another, separated only by small segments of cellular DNA without *EcoRI* sites. The results showed

that all of the viral DNA fragments were integrated both in the in vitro system (transformed rat cells) and in the in vivo system (hamster tumor). In both cases expression of the viral DNA was indicated by methylation of the inserts at sites C<sup>3</sup>CGG and CC<sup>3</sup>CGGG. Figures 8; references 23: 4 Russian, 19 Western (1 by Chaplygina, et al.).  
[719-12172]

UDC 578.2

#### ANALYSIS OF PRIMARY STRUCTURE AND LOCALIZATION OF COAT PROTEIN GENE IN GENOME RNA OF POTATO X VIRUS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 271, No 1, Jul 83  
(manuscript received 22 Apr 83) pp 211-215

MOROZOV, S. Yu., ZAKHAR'YEV, V. M., CHERNOV, B. K., PRASOLOV, V. S., KOZLOV, Yu. V., ATABEKOV, I. G. and SKRYABIN, K. G., Institute of Molecular Biology, USSR Academy of Sciences, Moscow; Moscow State University imeni M. V. Lomonosov

[Abstract] The complete sequence of nucleotides coding for the potato X virus coat protein was established by analyzing the primary structure of cloned DNA copies in *Escherichia coli*. DNA fragments of more than 300 nucleotide pairs were inserted into plasmid vector pBR322, and clones containing recombinant plasmids were selected. To simplify sequencing, DNA copies of the potato X virus genome were subcloned with use of restrictases BspRI and AluI and vectors pBR322 and pUR222. DNA structure was determined by chemical degradation. The mRNA for the capsid protein included the 3'-terminal region of the potato X virus genome. This region was similar in primary structure to the region at the beginning of the tobacco mosaic virus genome. The length of the 5'-terminal nontranslated zone (80 nucleotides) in the potato X virus was also comparable to that of other plant viruses. Figures 2; references 15:  
3 Russian, 12 Western.  
[986-9397]

#### MEDICAL AND SOCIAL ASPECTS OF HUMAN GENETICS

Moscow PRIRODA in Russian No 5, May 83 pp 26-32

BOCHKOV, Nikolay Pavlovich, academician of the USSR Academy of Medical Sciences, Director of the Institute of Medical Genetics of the USSR Academy of Medical Sciences, and Chief Scientific Secretary of the Presidium of the USSR Academy of Medical Sciences

[Abstract] A general review is presented on the anatomy and physiology of heredity in man, populational geography of hereditary diseases, and the diagnosis, treatment and prevention of hereditary diseases. Study of the



anatomy of heredity generally begins with a description of hereditary variants (100 new hereditary variants were discovered in 1981) and ends with the mapping of the human genome and identification of mutation loci. Considerable attention has also been focused on the mapping of mitochondrial DNA. Much of the progress in anatomy of heredity has been related to developments in the field of molecular biology. This also holds for the physiology of heredity, where hereditary diseases such as hemoglobinopathy can now be described in chemical rather than clinical terms. Achievements in the biochemical aspects of heredity have also improved the diagnosis of hereditary diseases such as xeroderma pigmentosum, thalassemia and feminization. About 300 hereditary metabolic disorders, all variants of chromosome diseases and others can be genetically diagnosed. Considerable progress has also been achieved in prenatal diagnosis with techniques such as amniocentesis. The more accurate diagnosis of hereditary diseases has improved their treatment as well. Promising approaches to treatment include diets, replacement hormone and enzyme therapy, and genetic engineering. Prevention of hereditary diseases is also a goal. Major approaches are genetic counseling and prevention of induced mutagenesis by monitoring and eliminating mutagenic factors in the environment, as well as non-environmental factors such as mutagenic drugs, food additives, and radiological diagnostic procedures. Figures 2; references 2: 1 Russian, 1 Western. [293-2307]

## LASER EFFECTS

UDC 617.7-007.681-085.849.19-07:617.754-07

### EFFECT OF LASER THERAPY ON VISUAL FUNCTIONS IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA

Moscow VESTNIK OPTAL'MOLOGII in Russian No 4, Jul-Aug 83 pp 10-13

[Article by Ye. L. Kazakova and V. S. Akopyan, candidate of medical sciences; All-Union Scientific Research Institute of Eye Diseases, (Professor M. M. Krasnov, academicians of the USSR Academy of Medical Sciences, director), USSR Ministry of Health, Moscow]

[Text] The primary factors determining the character and extent of changes in the visual field with glaucoma are the level of intraocular pressure and the condition of the optic disc. It has been established that with an increase in the size and depth of the glaucomatous cavity there is an increase in the size of the defects in the field of vision and a decrease in their reversibility (Drance, 1974; 1976; Douglas and coauthors, 1974; Hitchings and Spaeth, 1977). An analogous connection has been established between the level of intraocular pressure and defects in the field of vision (Armaly, 1969; Drance, 1972; Neisel and Flammer, 1981; and others). A number of authors also assert that after compensation of the glaucomatous process, it is possible reverse the development of defects in the field of vision in the form of complete or partial restoration of the visual field (V. N. Marinchev, 1972; Susanna and coauthors, 1978; Luntz and David, 1981).

Taking these facts into account, we decided to study the possibility of reversing the development of visual field defects after compensation of intraocular pressure, taking into account at the same time the condition of the optic disc in patients with primary open angle glaucoma. Compensation of intraocular pressure in these patients was achieved through anti-glaucoma laser intervention.

Research conditions. 1. The diagnosis of primary open angle glaucoma with defects in the visual field and uncompensated intraocular pressure must be clearly established before the laser procedure can be applied.

2. The period during which patients are observed following the procedure must be no less than 6 months.

3. Visual acuity during the indicated observation period should not decrease by more than 0.1.

4. Study of the field of vision should not be made earlier than 6 months following the laser intervention.

5. Intraocular pressure measured after the procedure using an aplanatic method should be compensated. Intraocular pressure is considered to be compensated when it is no higher than 21 mmHg, or if it is higher, there is stable compensation of visual functions throughout the entire course of the observation period.

**Methods and materials.** Before and after the laser procedure we measured visual acuity, field of vision, and condition of the posterior part of the eye. Intraocular pressure was measured using the aplanatic tonometry method and Goldmann's tonometer. The optic disc was examined through a dilated pupil using a slit lamp with a contact fundus lens. Primary attention was given to the E/D coefficient; also recorded were the presence of choroid membrane elements at the bottom of the cavity, the condition of the edge of the disc, and the course of the large vessels.

The field of vision was studied using methods of isopterperimetry and selective static perimetry, according to Armaly (1969), as modified by Rock and coauthors (1971) on the "Kugel-Penimeter"; the campimetry method was also used with the "Bausch and Lomb" company's campimeter.

Laser cyclotrabeculospasms and laser trabeculoplasty were applied as methods for treating glaucoma; an argon laser was used following the methodology described by M. M. Krasnov and coauthors (1982).

We studied a total of 100 patients (100 eyes) with primary open angle uncompensated glaucoma, with an age range of 35-78 years. The average age was 61 years. There were 39 women and 61 men.

Visual acuity among the majority of the patients (79 percent) before the laser procedure was 1.0. The average initial intraocular pressure was  $32.7 \pm 5.14$  mmHg (the range was between 26 and 52 mmHg). Various defects in the field of vision were discovered. Glaucomatous cavities with a coefficient of between 0.5 and 1.0 were discovered in all the patients during examination of the optic disc. It must be noted that in eyes with first-stage cavities (E/D up to 0.7), the defects were primarily in the central part of the visual field. Changes in peripheral limits were encountered more often with an increase in the size of the cavity and with central defects.

Changes in the functional status of the eyes were measured 6 months after the procedure (if the intraocular pressure was 21 mmHg or lower) and 6 to 12 months later (if the intraocular pressure was higher than 21 mmHg).

**Results.** Six months after the laser procedure a 0.1 decrease in visual acuity was observed in 4 patients due to cataracts. There was a 0.1-0.2 increase in visual acuity over the initial level in 7 patients. Intraocular pressure decreased in all the patients after laser cyclotrabeculospasms and laser trabeculoplasty; the average intraocular pressure was  $20.4 \pm 3.62$  mmHg. In 17 of the 100 cases the intraocular pressure 6-12 months after the laser procedure was higher than 21 mmHg; however, in all 17 of these cases there were no

negative changes in the condition of the visual field; in 6 of the 17 cases there were positive changes; and in 3 cases there was complete restoration of the visual field. No patients had any negative changes in the condition of the posterior part of the eye.

Changes in the visual field following the laser procedure according to the size of the glaucomatous cavity

<u>Indicator</u>	<u>Type of change in visual field</u>		
	<u>Restoration</u>	<u>Improvement</u>	<u>Stablization</u>
Total no. of eyes	32	33	32
with E/D up to 0.7	24 (75)	19 (57.6)	15 (46.9)
with E/D 0.8 and above	8 (25)	14 (42.4)	17 (53.1)

Note: Figures in parentheses represent data expressed as percentage.

Four groups of patients were established based on the condition of the visual field and compensated intraocular pressure. The first group had complete restoration of the visual field and contained 32 eyes (32 percent); the second group had partial restoration of the visual field and contained 33 eyes (33 percent); the third group had a stabilization of functions and contained 32 eyes (32 percent); and the fourth group had a decline in visual functions and contained 3 eyes (3 percent). A positive change in the condition of visual functions was observed in 65 percent of the cases.

One of the 3 patients who had a decline in the visual field also had a high degree of myopia and hypertonic angiosclerosis; another had a high degree of myopia and cataracts; and in the third, who had a glaucomatous cavity (E/D 0.9), there was a progressive decline in the visual field in spite of compensation of intraocular pressure.

The groups of patients who showed improvement or stabilization of the visual field were divided into subgroups depending on the size of the E/D: those with glaucomatous cavities in the beginning stage (E/D up to 0.7); and those with developed cavities (E/D of 0.8 or more). Normalization of the visual field following compensation of the intraocular pressure occurred primarily in eyes with glaucomatous cavities in the beginning stage (see the table above). As the size of the cavity increased, the probability of a positive change and normalization of the visual field decreased. With an E/D of 0.6, positive changes and normalization were observed in 22 cases; with an E/D of 0.7, they were observed in 21 cases; with an E/D of 0.8, they were observed in 14 cases; and with an E/D of 0.9 or higher, they were observed in 8 cases.

Conclusions. 1. With normalization of intraocular pressure at the early stages of the glaucomatous process, it is possible not only to improve visual functions, but also to eliminate completely defects in the visual field.

2. Intraocular pressure should be considered to be compensated when visual functions remain stable, even if the intraocular pressure slightly exceeds 21 mmHg.

3. In determining the stage of the disease in primary open angle glaucoma, especially in cases of compensated glaucoma, the condition of the optic disc is more important (in comparison with the visual field).

4. Laser cyclotrabeculospasis and laser trabeculoplasty allow compensation of intraocular pressure and provide significant improvements in the functional status of eyes with primary open angle glaucoma, without a substantial decline in visual acuity.

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**LASER COAGULATION OF INTRAOCULAR TUMORS AND PREVENTION OF THE REACTIVE HYPERTENSIVE SYNDROME**

Moscow VESTNIK OPTAL'MOLOGII in Russian No 3, May-Jun 83 pp 55-57

[Article by Professors A. Ya. Bunin and A. F. Brovkins and senior scientific associates V. N. Yermakova and N. V. Makarskaya; Pathophysiology Department and Ophthalmology Department of the Moscow Eye Diseases Scientific Research Institute imeni Gel'mgol'ts (K. V. Trutneva, candidate of medical sciences, director)]

[Text] Experimental research on the effect of laser irradiation on eye tissue has shown that it is possible to cause reactive changes in the form of myosis, a transitory increase in intraocular pressure, and an increase in the protein content of the aqueous humor (Perkins and coauthors, 1973). Using the terminology of A. P. Nesterov (1974), this set of symptoms can be called the reactive syndrome. These changes are caused by an increase in the formation of prostaglandins in the tissues subjected to laser coagulation.

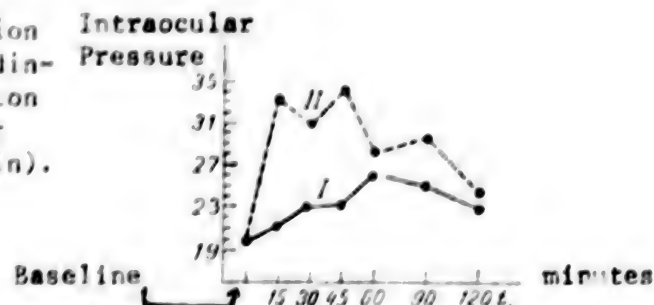
Experiments have shown that the dilation of retinal vessels around the post-coagulation sites is tied to a release of prostaglandin  $E_2$  (Pournaras and coauthors, 1978). At the same time the vessels of the ciliary processes also expand; there is an increase in their permeability; the blood-eye barrier is broken; and edema of the ciliary body appears. The increase in intraocular pressure with laser coagulation is tied to an increase in the ultra-filtration of fluid from the capillaries of the ciliary processes and to an increase in the blood accumulating in the ciliary body (Unger and coauthors, 1974).

The miosis that arises in the process of laser coagulation is most likely caused by the effect of prostaglandins on the tone of the smooth muscles of the iris (the sphincter of the pupil). Data found in the literature (Unger and coauthors, 1977) and from our clinical observations confirm the resistance of miosis to the effect of atropine. The posterior synechia that develops in the post-coagulation period hinders further expansion of the pupil for repeated laser coagulation and detailed examination of the posterior part of the eye. In connection with this, a goal was set to find mydriatic drugs that would make it possible to obtain stable mydriasis long enough to prevent an increase in intraocular pressure and other manifestations of the reactive syndrome.

The effects of three mydriatic drugs were studied under experimental and clinical conditions; the mydriatic drugs used were a 1 percent solution of mesaton, a 2 percent solution of amisyl, and a 1 percent solution of mydriacil (from the "Alcon" company, USA).

In an experiment on 12 rabbits under conditions of experimental hypertension, caused by instillation of prostaglandin  $E_2$  in a 1:3 dilution, clear data were obtained indicating that only the preliminary subconjunctival injection of 1 percent mesaton (given to 4 rabbits) significantly limited the increase in intraocular pressure caused by the subsequent introduction of prostaglandin  $E_2$  (see the figure). Neither amisyl nor midriacil (used on 8 animals) had any effect on intraocular pressure caused by the prostaglandin.

The effect of a subconjunctival injection of mesaton on the course of prostaglandin-induced intraocular hypertension (mesaton was introduced into the test eye 1 hour before instillation of the prostaglandin). I--test eye; II--control eye.



Under clinical conditions 39 patients with choroid melanoblastomas no more than 12 mm in diameter, no thicker than 2 mm, and lying post-equatorially, were subjected to laser coagulation. An argon laser model 900 (from the "Coherent Radiation" company, USA) was used to apply the irradiation in continuous doses. In 10 cases a subconjunctival injection of mesaton (0.2 ml of a 1 percent solution) was applied to dilate the pupil prior to laser coagulation (40-60 minutes before the operation). In all cases mydriasis reached 7-8 mm and lasted no less than 3 hours. Intraocular pressure before and after the treatment fluctuated between  $20.3 \pm 0.8$  and  $21.0 \pm 0.9$  mmHg. During a control examination of the patients 2 months later the pupils dilated under the influence of mydriatic drugs almost to the maximum limit, maintaining their proper form at the same time.

Instillations of amisyl and mydriacil were used for pupil dilation on 29 patients. An average increase of 4.74 mmHg in intraocular pressure after laser coagulation was noted in 21 eyes. It was fixed 15 minutes after the intervention; it remained in effect for 2 1/2-3 hours; and it was evident at all examination intervals (see table 1). The ophthalmic tension of paired eyes fluctuated between  $21.4 \pm 0.4$  and  $21.7 \pm 1.2$  mmHg. The hydrodynamics of 6 eyes before and after laser coagulation were studied (see table 2). The research results show that after laser coagulation  $P_0$  increased by more than 6 mmHg, due to a sharp rise in the production of aqueous humor.

In 3 eyes after laser coagulation ophthalmic tension rose very sharply (up to 43-45 mmHg), which caused in 2 patients edema of the cornea and a pain syndrome. Hypotensive drugs were successful in easing the pain.

Some investigators believe that the increase in ophthalmic tension after laser coagulation is proportional to the intensity of the laser irradiation (Unger and coauthors, 1981). An analysis of our results shows that an increase in intraocular pressure of 5-7 mmHg occurred in those cases in which laser coagulation was applied at an intensity of 1000-1400 milliwatts, with 120-270 applications over an area 500-1000 micrometers in diameter. Laser coagulation was applied a second time on 14 patients (6-12 months later) to areas in which

there was evidence of a recurrence of the tumor and that were surrounded by a sufficiently broad chorio-retinal scar. In spite of the fact that in these cases the same physical and technical conditions of laser coagulation were applied, the intraocular pressure rose only by 2-4 mmHg.

Table 1. The dynamics of intraocular pressure in healthy and diseased eyes at different points following laser coagulation.

<u>Period of observation</u>	<u>Number of eyes</u>	<u>Intraocular Pressure (M+m)</u>		<u>P</u>
		<u>healthy eye</u>	<u>diseased eye</u>	
Immediately after treatment	21	21.7 $\pm$ 0.4	20.3 $\pm$ 0.4	
15-20 min	17	21.7 $\pm$ 0.4	25.9 $\pm$ 1.2	<0.01
30-40 min	17	21.4 $\pm$ 0.4	23.9 $\pm$ 0.9	<0.02
1 hr	14	21.6 $\pm$ 0.7	25.6 $\pm$ 1.0	<0.01
2 hrs	15	21.3 $\pm$ 0.4	24.7 $\pm$ 1.1	<0.01
3 hrs	11	21.7 $\pm$ 1.2	25.1 $\pm$ 1.3	<0.05

Table 2. Hydrodynamics of diseased eyes as influenced by laser coagulation

<u>Period of observation</u> (6 eyes)	<u><math>\frac{P}{M + m^0}</math></u>		<u><math>\frac{C}{M + m}</math></u>		<u><math>\frac{F}{M + m}</math></u>	
	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>
Before laser coagulation	11.2 $\pm$ 0.6		0.34 $\pm$ 0.4		0.7 $\pm$ 0.2	
		<0.01		<0.9		<0.01
After laser coagulation	17.3 $\pm$ 1.3		0.36 $\pm$ 0.01		2.5 $\pm$ 0.4	

One of the likely causes for the small increase in intraocular pressure in these patients is the presence of a sufficiently strong avascular chorio-retinal scar around the section that was subjected to repeated irradiation.

The results that we obtained in our experimental and clinical observations made it possible to distinguish varied pupil and intraocular pressure reactions to laser coagulation depending on the mydriatic drugs applied beforehand. It should be emphasized that neither amisyl nor mydriacil caused stable mydriasis in the laser coagulation process. Only the application of mesaton made it possible to retain the maximum mydriasis and normal intraocular pressure in patients exposed to laser irradiation. Our experimental and clinical observations, as well as data in the literature, allow us to explain the results as a consequence of pharmacological antagonism between mesaton and the prostaglandins (A. Ya. Bunin and V. N. Yermakova, 1978).

It is also possible that the reduced hypertensive reaction in the eye is tied to mesaton's vasoconstrictor effect, which would influence the vessels of the ciliary processes.

Thus, the data presented above support the use of subconjunctival injections of mesaton before laser coagulation of intraocular tumors, both as an effective mydriatic drug and as a preventive measure against the development of the hypertensive syndrome.

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## LASER USED IN HEART SURGERY

Alma Ati KAZAKHSTANSKAYA PRAVDA in Russian 26 Aug 83 p 4

[Article by V. Gavelene and Z. Khromova: "A Laser Operates on the Heart"]

[Text] Professor Yu. Bredikis, corresponding member of the USSR Academy of Medical Sciences, together with V. Obelenis, candidate of medical sciences, performed a rare operation, to restore the rhythm of a heart, using a laser at the clinic of the Kaunas Medical Institute.

The patient was a 43-year old worker who was suffering from severe attacks of arrhythmia, which sometimes lasted several days. It became necessary to make a correction in the heart's conduction system, to cut the auxiliary nerve branches of the so-called Bundle of His. In such cases it is necessary to perform a long and complex operation, in which an artificial blood pumping unit is used.

This time, however, the patient was helped without having to stop his heart and with minimal surgical intervention. Literally only a few instants were needed to insert into the heart a flexible fiber filament, through which a laser beam was directed to cut the Bundle of His without drawing blood. This was accomplished with the help of an original new laser device created by Professor R. Ambartsumyan in the laser surgery laboratory of the Physics Institute imeni P. N. Lebedev, of the USSR Academy of Sciences.

The methodology for such operations was worked out in thorough preliminary tests by Lithuanian surgeons in conjunction with Professors O. Skobelkin and Ye. Brekhov; and S. Zdradovskiy, candidate of medical sciences, at the surgical clinic and laser laboratory of the 51st Moscow city hospital.

Professor O. Skobelkin said in a conversation with a TASS correspondent: "The efforts of Soviet physicians in the field of laser surgery have already received broad recognition and are having visible practical results. However, the attempt to penetrate the heart with the help of a laser scalpel is the most remarkable joint work of Soviet physicians and physicists; it represents a new step in world surgery. The success of the operation was without a doubt a result of the high level of mastery, which was increased by the bonds of cooperation between the two surgical schools in Moscow and Kaunas."



# INFLUENCE OF LASER RADIATION ON BONDING OF BROMTHYMOL BLUE BY MICROSOMES

Moscow BIOFIZIKA in Russian Vol 28, No 4, Jul-Aug 83  
(manuscript received 9 Mar 82) pp 697-698

DREVAL', V. I., Kuybyshev State University

[Abstract] Conformational changes in membrane proteins upon exposure to laser radiation were studied by examining the bonding of the sulfophthalein dye bromthymol blue with microsomes. The microsomes were extracted from rat livers, the microsome residue suspended in 0.25 M saccharose at pH 7.4. The suspension was irradiated with a helium-neon laser for 30 minutes with continuous agitation at 2-4°C. It was found that in the  $0.5-3.0 \cdot 10^{-5}$  M concentration range, bonding of bromthymol blue with microsomes is described by the Langmuir equation of monomolecular sorption, allowing calculation of the values of  $n$  and  $\Delta F^0$  for control and irradiated membranes. The data indicate that when low energy laser radiation acts on microsomes there is a change in the structure of the membrane proteins accompanied by a decrease in their sorption surface and a change in the value of  $\Delta F^0$  for bromthymol blue. Figure 1; references 12: 5 Russian, 7 Western.  
[682-6508]

UDC 613.647-07-612.663

INFLUENCE OF POWER LINE FREQUENCY ELECTRIC FIELDS ON THE REPRODUCTIVE  
FUNCTION OF ANIMALS

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 83  
(manuscript received 21 Jul 82) pp 70-71

SOKOLOVA, I. P. and NIKONOVA, K. V., Scientific Research Institute of Labor  
Hygiene and Occupational Diseases, USSR Academy of Medical Sciences, Moscow

[Abstract] Results are presented from studies designed to estimate the influence of power line frequency electric fields with intensities of 65-250 kV/m in daily 2 hour exposure on the development of the progeny of white mice of the SHK line during the antenatal and post-natal periods. Four hundred twenty reproductively mature animals, 350 females and 70 males, were used in the study. More than 250 pregnant females, 1070 embryos and 450 pups were examined. Two control groups were used, one of which was exposed to the same cage in which the electric field exposure was performed, while the others stayed in the same cages all the time. The experiments indicated that electric fields of the intensities used in the study had no significant influence of the reproductive function of the white mice. References 4: 3 Russian, 1 Western.  
[676-6908]

UDC 577.1

ROLE OF LIPID PEROXIDATION IN RETINAL DAMAGE DURING HYPERBARIC OXYGENATION  
AND POSSIBLE CHEMICAL PROTECTION WITH ANTIOXIDANTS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 271, No 1, Jul 83  
(manuscript received 27 Dec 82) pp 227-230

KAGAN, V. Ye., BRATKOVSKAYA, L. B., KULIYEV, I. Ya. and SHEVDONA, A. A.,  
Institute of Chemical Physics, USSR Academy of Sciences, Moscow; Moscow State  
University imeni M. V. Lomonosov

[Abstract] The effect of hyperbaric oxygenation (3 at) on retinal electrical activity in male Wistar rats, the content of lipid peroxidation (LP) products in the retina in vivo, and the activity of enzymatic and nonenzymatic LP regulation systems were studied; the use of antioxidants (4-methyl-2,6-ditertbutylphenol and OP-6, a hydroxypyridine) to protect the retina from

damage was assessed. Antioxidants were administered intraperitoneally 3 days before hyperbaric oxygenation once a day at the rate of 100 mg/kg of body weight. Exposure of animals to hyperbaric oxygenation for 5 hr suppressed retinal electrical activity, which recovered to 73% of its original level 48 hr after treatment. The antioxidants exerted a pronounced protective effect: retinal damage was markedly reduced and electrical activity was almost totally restored within 48 hr. The content of LP products increased after hyperbaric oxygenation owing to a low level of antioxidants, such as endogenous  $\alpha$ -tocopherol, in the retina. Activity of superoxide dismutase in the retina was similar in control and test animals. Thus, a major factor in regulating LP in retinal photoreceptor cells is the endogenous pool of antioxidants. Figure 1; references 14: 6 Russian, 8 Western.  
[006-9307]

HYGIENIC REGULATION OF VIRAL CONTAMINATION OF ENVIRONMENTAL OBJECTS

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 83  
(manuscript received 2 Aug 82) pp 9-12

BAGDASAR'YAN, G. A., Scientific Research Institute of General and Communal Hygiene imeni A. N. Sysin, USSR Academy of Medical Sciences, Moscow

[Abstract] Studies have been directed in recent years toward development of a number of major problem topics allowing a new approach to hygienic regulation of viral contamination. Problems studied include determination of levels of viral contamination actually existing in environmental objects, study of the specifics of behavior of viruses defining the nature of their propagation under the current conditions of chemical and biological contamination of water and soils, as well as establishment of effective hygienic measures for limitations of the circulation of viruses in the environment. This article notes some of the specific studies undertaken by various scientific research institutes in recent years. These studies have been primarily directed toward water polluted to various degrees, the air in closed rooms and the soil in populated areas. However, the food factor is also an important means of the spread of viral diseases. It has been found that the coli-phage content is a more reliable indicator of overall microbiological contamination than the content of intestinal bacillus. Promising trends for future studies in the area of viral contamination of the environment are noted, including study of the specifics of the circulation of viruses in chemically polluted media, establishment of the quantitative variation of viral infection morbidity as a function of level of microbial pollution of water, determination of combined effects of biological factors on the organism, improvement of methods of indication of various groups of viruses in the environment, determination of the most adequate viral contamination indicators for environmental objects and determination of the effectiveness of methods of decontamination of environmental objects for removal of viruses. Reference 1 (Russian).  
[676-6508]

# PECULIARITIES OF NITROREDUCTION AS A KEY STAGE IN MICROBIAL DESTRUCTION OF AROMATIC NITROCOMPOUNDS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 19, No 4, Jul-Aug 83 (manuscript received 19 Nov 81) pp 507-512

NAUMOVA, R. P., AMERKHANOVA, N. N. and ZOLOTUKHINA, L. M., Kazan State University

[Abstract] The basic regularities of nitroreduction of 2,4,6-trinitrotoluene (TNT) by two active degraders of aromatic nitrocompounds, *Pseudomonas denitrificans* and *Escherichia coli* were studied. It was found that bacterial cells of any age were capable of nitroreduction but the nature of the attack changed with age. A study of whether the pH of the medium during cultivation of the bacteria affects nitroreduction and its rate showed the preferential trend of nitroreduction for the nitrogroup in position 2 was maintained for all pH values tested (5.5 to 7.8). Bacterial reduction in vitro was NAD(P)H-dependent. Tests of flavins and five metal ions showed that only flavine-adenine dinucleotide and  $Mn^{2+}$  and  $Mg^{2+}$  stimulated nitroreduction. The reduction (in descending availability) of nitroderivatives of benzene, toluene, benzoic acid and phenol showed the absence of strict substrate specificity in the nitroreductases studied. Figures 3; references 6: 3 Russian, 3 Western. [673-2791]

UDC 577.154.31

# REVERSIBILITY OF ACID INACTIVATION OF IMMOBILIZED ALPHA-AMYLASE

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 19, No 4, Jul-Aug 83 (manuscript received 7 May 82) pp 528-532

TURCHENKO, V. S., KOSTAREVA, I. A., PONOMAREVA, R. B. and SAMSONOV, G. B., Institute of High-molecular Compounds, USSR Academy of Sciences, Leningrad

[Abstract] The effect of some factors on reactivation of both free and immobilized alpha-amylase was studied. Reactivation of acid-inactivated alpha-amylase of *Bacillus subtilis* in slightly alkaline media was examined. The observed effect of reversible inactivation of immobilized alpha-amylase was assumed to be the result of inactivation of the alpha-amylase in the cellular polymer phase in the acid medium, partial reactivation of the enzyme in the polymer phase in alkali media and yield of the enzyme from the polymer phase in solution. The degree of reversibility of acid inactivation of the immobilized alpha-amylase was higher than that of the natural enzyme. It was assumed scattering and association of the enzyme may proceed to a lesser degree in polymers with smaller pores than in polymers with large pores, therefore greater stabilization of immobilized alpha-amylase will be seen on such polymers upon inactivation in acid media. Figures 3; references 9: 7 Russian, 2 Western. [673-2791]



## EFFECT OF GAMMA-RADIATION ON TRYPSIN IMMOBILIZED ON DIALDEHYDE CELLULOSE

Moscow PRILADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 19, No 4,  
Jul-Aug 82 (manuscript received 5 Jan 82) pp 533-536

VIRNIK, M. B., RYL'TSEN, V. V., VLASOV, L. G., DOVBIY, Ye. V. and  
KALASHNIK, A. T., All-Union Scientific Research Institute of the Textile-  
Paperdasher Industry, Moscow; Scientific Industrial Association  
'Khimvolokno', Mytishchi, Moscow Oblast

[Abstract] Effect of an 0.5 to 10 mrad dose of ionizing radiation on native trypsin, cellulose, dialdehyde cellulose and trypsin immobilized on dialdehyde cellulose was studied by the electron paramagnetic resonance method. Types of radicals forming in the substance studied were determined by electron paramagnetic spectra. The concentration of radicals increased with the increase of the radiation dose. It was assumed that partial recombination of trypsin radicals with dialdehyde cellulose radicals proceeds in both the mechanical mixture of dialdehyde cellulose and trypsin and in products of interaction of trypsin and dialdehyde cellulose after gamma irradiation. It was found that the resistance of immobilized trypsin to gamma-radiation is associated with recombination of trypsin radicals with dialdehyde cellulose radicals and with migration of them to weakened bonds on the dialdehyde cellulose. Figures 4; references 14: 8 Russian, 6 Western.

[673-2701]

UDC 576.8.093(088.8)

## CONTINUOUS CULTIVATION OF LUMINESCING BACTERIA PHOTOBACTERIUM PHOSPHOREUM WITH CONTROL OF LUMINESCENCE

Moscow PRILADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 19, No 4,  
Jul-Aug 82 (manuscript received 30 Nov 81) pp 564-568

KADWITSEV, V. V. and MEZHEVIKIN, V. V., Institute of Biophysics, Siberian  
Division, USSR Academy of Sciences, Krasnoyarsk

[Abstract] Possibilities of continuous cultivation of luminescing bacteria *Photobacterium phosphoreum* were studied by controlling the flow of the nutrient medium according to luminescence intensity. The luminescence of the culture increased practically immediately after inoculation of the bacteria in the nutrient medium and reached a peak value of  $6.6 \cdot 10^{12}$  quanta  $\cdot$  ml $^{-1}$   $\cdot$  s $^{-1}$  within 12.5 hours. At a luminescence level of  $4.1 \cdot 10^{12}$  quanta  $\cdot$  ml $^{-1}$   $\cdot$  s $^{-1}$  on media containing 6 or 9 g/l of glycerin, the stability of the cultivation process was disturbed, the density of the culture increased and the specific luminescence dropped. This method may be used to determine the biomass of bacteria or to make gauges to test environmental pollution. Figures 3; references 6: 4 Russian, 2 Western.

[673-2701]

SYNTHESIS OF SURFACE ANTIGEN OF HEPATITIS B VIRUS IN *Escherichia coli*

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 271, No 1, Jul 83  
(manuscript received 8 Feb 83) pp 230-234

PUMPEI, P. P., KOZLOVSKAYA, T. M., BORISOVA, G. P., BYCHKO, V. V.,  
DISHLER, A. V., KALIS, Ya. V., PUDOVA, N. V., GREEN, E. Ya., KRIYEVINYA, V. Ya.  
and KUKAYN, R. A., academician of the Latvian SSR Academy of Sciences;  
Institute of Organic Synthesis, Latvian SSR Academy of Sciences; Institute of  
Microbiology imeni Avgust Kirshenshteyn, Latvian SSR Academy of Sciences, Riga

[Abstract] Chimera genes, including the complete gene for HB<sub>s</sub>Ag, were produced with the plasmid pHB320 carrying the complete hepatitis B virus (HBV) gene, and the expression of chimera proteins in *Escherichia coli* under the control of bacterial promoters P<sub>cat</sub>, P<sub>kan</sub>, P<sub>bla</sub> and P<sub>trp</sub> was compared. The cloned HB<sub>s</sub>Ag gene was similar to HB<sub>s</sub>Ag subtype ayw; there were nine nucleotide substitutions. Greatest synthesis of HB<sub>s</sub>Ag-like structures in *E. coli* was observed was under the control of promoter P<sub>trp</sub>: cat-HB<sub>s</sub>Ag<sup>204</sup> > kan-HB<sub>s</sub>Ag<sup>226</sup> ≥ cat-HB<sub>s</sub>Ag<sup>226</sup>. This relationship was also observed in vitro in a coupled protein synthesis system. The technique of competitive immunoprecipitation with <sup>125</sup>I-labeled monomeric subunits of HB<sub>s</sub>Ag was sufficiently accurate for assessing HB<sub>s</sub>Ag synthesis in bacteria. The expression of the HB<sub>s</sub>Ag gene in bacteria could be of value for the creation of diagnostic preparations and an anti-HBV vaccine. Figures 4; references 13: 1 Russian, 12 Western.  
[57-9307]

UDC 547.963.2

STRUCTURAL SPECIFICS OF SCP2 PLASMIDS OF STREPTOMYCES COELICOLOR A3(2)

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 17, No 2, Mar-Apr 83  
(manuscript received 27 May 82) pp 356-361

PEL'TS, L. B., VETOSHKIN, A. V. and SLADKOVA, I. A., All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow

[Abstract] An electron microscope study of the plasmid SCP2 extracted from derivatives of *S. coelicolor* A3(2) is reported. Electron microscope study of the plasmid DNA was performed by the method of Davis. The hyperphase contained 73% formamide, 0.1 M tris, 10 mM EDTA, 0.1 mg/ml cytochrome C and 0.5 µg/ml DNA. The hypophase was double distilled water. An insert was found to be present in the S18-1 strain plasmid, absent in the plasmids of strains A365 and S18-45. A transposon-like structure was found in all of the SCP2 plasmids studied. The structural specifics observed cannot be related to specific genetic characteristics. However, the physical mapping of the plasmid is a necessary stage in the construction of a vector based on it. Figures 4; references 10: 2 Russian, 8 Western.  
[678-6508]

UDC 547.963.3

ION-EXCHANGE PROPERTIES OF IMMOBILIZED DNA: INFLUENCE OF POLYMER CONCENTRATION AND SOLVENT ON ALKALI METAL ION EXCHANGE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 17, No 2, Mar-Apr 83  
(manuscript received 18 Jun 82) pp 403-409

KUZNETSOV, I. A., KARGOV, S. I., KHAMIZOV, R. Kh. and GORSHKOV, V. I., Chemistry Faculty, Moscow State University imeni M. V. Lomonosov

[Abstract] A study was made of the interaction of sodium, potassium and lithium cations with immobilized DNA by frontal separation of various mixtures of these ions on columns with a new DNA-based ionite immobilized in polyacrylamide gel. The work utilized a Hungarian-produced high-polymer sodium salt of DNA from chick erythrocytes. The polyacrylamide gel was synthesized using a N, N'-methylene-bis-acrylamide cross linking agent. The polymerization

Initiator used was a redox pair, N, N, N', N'-tetramethylethylenediamine and  $K_2S_2O_8$ . The ion exchange properties of the immobilized DNA were studied dynamically on 60 x 1 cm columns, the alkali metal ion concentration determined by flame photometry. It is concluded that systems containing more concentrated DNA are more selective for potassium ions during exchange in water-dioxane solutions. Figures 7; references 24: 10 Russian, 14 Western. (676-6908)

UDC 591.175:612.015.32

#### INCORPORATION OF SYNTHETIC PHOSPHOLIPIDS INTO SARCOPLASMIC RETICULUM MEMBRANES FROM RABBIT MUSCLES

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 17, No 2, Mar-Apr 83  
(manuscript received 25 Feb 82) pp 410-417

MONIKOVSKIY, Yu. Sh., TAT'YANENKO, L. V. and NEKRASOVA, N. A., Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna, Moscow oblast

[Abstract] A study is presented of the transport of  $Ca^{2+}$ -dependent ATP-ase in the SR of rabbit skeletal muscles. The SR membrane was modified by incorporation of various phospholipids and their analogs. The catalytic activity of  $Ca^{2+}$ -dependent ATP-ase was studied over a broad range of temperatures. Synthetic lipids were incorporated into the SR by treatment of the SR specimen with deoxycholate in the presence of a 500-times excess of the lipid with subsequent dialysis, and by ultrasonic treatment of a mixture of SR and the liposomal preparation of the synthetic lipid. The results produced allow a schematic representation of the process of incorporation and reconstruction of  $Ca$ -dependent ATP-ase. The protein of the ATP-ase is firmly bonded to adjacent lipids; this bond is not broken as the liposomes are incorporated into the membrane, but changes as a function of the liposome structure upon reconstruction of the ATP-ase. Figures 6; references 24: 11 Russian, 13 Western. (676-6909)

UDC 615.285.7.015.46:612.017.1/076.9

EFFECT OF THE HERBICIDE 2,4-D (AMINE SALT) ON IMMUNOLOGIC REACTIVITY OF ANIMALS

Moscow GIGIYENA I SANITARIYA in Russian No 5, May 83  
(manuscript received 13 Dec 82) pp 73-74

ZHAMBARANOVA, S. D., BADMAYEVA, D. B. and SPERANSKAYA, T. D., East Siberian Institute of Technology, Ulan-Ude

[Abstract] A study is presented of antibody formation in the organism and antigens developed in the livers of rats upon long-term administration of small doses of the amine salt of 2,4-dichlorophenoxyacetic acid (2,4-DA). Experiments were performed on mongrel male rats, the herbicide administered perorally at 1/100th of the LD<sub>50</sub> in an aqueous solution each day for 7, 15, 24 and 30 days. In each of these stages of the experiment, rat blood sera and water-salt extracts of liver, kidney and lung tissues were used in the complement-binding reaction, passive hemagglutination reaction, precipitation reactions and immunoelectrophoresis. Anomalous antigen liver complexes containing the herbicide were found in the gamma-globulin area. Antigens found in the area of  $\alpha$  and  $\beta$  globulins apparently appear upon a change in the immunologic specificity of proteins of the organism as a result of the indirect toxic effect of the herbicide on the cells or damage to the cells by antibody-antigen complexes formed on their surfaces. The data thus indicate formation of antitissue antibodies in the blood serum of rats upon exposure to 2,4-DA. The greatest immune response was observed on days 15-24 of administration of the preparation. Immunoelectrophoretic analysis of liver extracts after 15 days revealed anomalous antigens in the  $\alpha$ -,  $\beta$ - and  $\gamma$ -globulins. The liver antigens producing a precipitation band in the area of  $\beta$ - and  $\gamma$ -globulins are tissue specific. The anomalous antigen detected in the  $\gamma$ -globulin area, interacting with antigens to 2,4-D, is a herbicide-protein complex. Figures 2; references 3 (Russian)  
[710-6598]



## BIOLOGICAL PROPERTIES OF BACTERIAL ENDOTOXINS

Moscow SOVETSKAYA MEDITSINA in Russian No 7, Jul 83  
(manuscript received 21 May 82) pp 31-34

TU'YANOV, M. Kh., PAK, S. G., KAZANSKAYA, L. V. and BOBYLEV, R. V., Chair of Infectious Diseases of the Sanitary-Hygienic Faculty and Laboratory of Prostaglandin Biosynthesis TsNIL [Central Scientific Research Laboratory] First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] In vitro studies were conducted with endotoxins derived from *S. typhimurium*, *S. newport*, *E. coli*, *S. typhi* and a cholera diagnostic reagent which showed that these agents were capable of converting arachidonic acid into prostaglandins (PG). Whereas endotoxins derived from *E. coli* and *S. typhi* promoted the formation only of PG-E<sub>2</sub> and PG-A<sub>2</sub>, the other preparations also promoted arachidonic acid conversion into PG-F<sub>2α</sub>. Since lipid A is virtually identical in all the Gram-negative bacteria, it may be a factor responsible for PG biosynthesis under the influence of endotoxin. The previously unknown ability of endotoxins to promote formation of PG will add new understanding to the pathogenic mechanisms underlying infection with the Gram-negative bacteria. References 14: 7 Russian, 7 Western.  
[689-12178]

UDC 541.182.644

## IMMOBILIZATION OF THERAPEUTIC PREPARATIONS, NEW DIRECTION IN USE OF ORGANOSILICON ADSORBENTS

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR SERIYA B GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 5, May 83  
(manuscript received 21 Jan 83) pp 67-69

ZNAMENSKIY, V. A., SAMODUMOVA, I. M., LEVENETS, V. N., KEYSEVICH, L. V., ZEMSKOV, V. S., KISELEVA, L. I. and YATSIMIRSKIY, K. B., academician of the Ukrainian SSR Academy of Sciences; Institute of Physical Chemistry, Ukrainian SSR Academy of Sciences

[Abstract] Polymethylsiloxane, a polyfunctional adsorbent with various active groups on its surface, was tested as an adsorbent for drugs (gentamicin, an antibiotic active against gram-negative microorganisms, and contrical, a proteolysis inhibitor) with the aim of prolonging drug action. The immobilized drugs were obtained by incubating the polymethylsiloxane matrix with the two drugs. Testing of bactericidal properties on *Pseudomonas aeruginosa* 25 or *Staphylococcus aureus* 209 revealed that gentamicin retained its activity for at least 5-6 days and contrical for 3 days (in comparison with 6-12 hr if these drugs were administered without preliminary immobilization). Administration of gentamicin and contrical, immobilized on polymethylsiloxane, to 15 patients with severe purulent-septic complications following trauma or surgery produced a pronounced clinical effect: general state improved, temperature normalized, purulence ceased, and wound healing began. References 7 (Russian).  
[595-9307]

## PUBLIC HEALTH

### CITY HEALTH SERVICE CRITIQUED

Vilnius SOVETSKAYA LITVA in Russian 9 Aug 83 p 2

[Article by Z. Gauril'chikene, Deputy Chairman, Shyauliyay Gorispolkom:  
"The City Health Service: Achievements and Problems"]

[Text] "Health problems undoubtedly must occupy an ever-increasing place in party social policy.... Indeed the matter is one of health of the people, i.e., record-keeping in the social as well as the economic plan." (From Proceedings of the June (1983) CPSU Central Committee Plenum)

One of the most important duties of local soviets [councils] is to take care of public health development. We are directed to do this by the decree of the CPSU Central Committee and the USSR Council of Ministers on additional measures for improving public health, and by documents from the June (1983) CPSU Central Committee Plenum.

The basic directions for improving the medical service are set down in a plan worked out by the Shyauliyay Gorispolkom--building up the material base of health care institutions, and, overall universal prophylactic dispensarization of the population. In this regard, a great deal of attention is given to the second point, for it is less important to have good conditions for curing sick people than to guarantee healthy and safe conditions for daily work and life of the people, thereby preventing a disease. We feel that prophylaxis is not the work of physicians alone.

What have we achieved in the last five years? Much has been done to build up the material base of therapeutic institutions. A builders' polyclinic was constructed, handling 250 cases in a shift, a pediatric polyclinic handling 400 visits, a surgical building with 260 beds and a major food unit in the republic hospital. The sanitary epidemiological station and several departments in the old building of the republic hospital underwent major repairs, and a good deal of other important jobs were done. Thanks to these measures, the bed supply in city hospitals has grown to 1,650 units at the present time. Today, 51½ physicians and more than 1,600 mid-level medical personnel watch over the health of residents of Shyauliyay. Incidentally, I would note that we have exceeded the average republic level in both indices--number of beds and number of medical personnel.

Of course, quantitative indices still do not indicate obligatory qualitative growth. The gorispolkom is directing more attention toward increasing the qualifications of medical employees. High professional training cannot be separated from political and moral training. The measures taken in the city are directed toward instilling these qualities and increasing the work and moral level of the employees. Thus, last year, one All-Union, three republic, two interzonal and 46 zonal conferences were organized. Every year, the qualifications of 25 percent of medical personnel are raised at local and Union bases. At the present time, approximately 400 medical employees have skill categories. Ten of them have the degree of candidate of medical sciences and one the degree of doctor of medical sciences. Enrichment of their store of knowledge, familiarizing them with leading experience of colleagues from other cities and fraternal republics, and a creative attitude toward work add up to the fact that up to 100 new methods of therapy and diagnosis of disease have been introduced in therapeutic institutions in the course of the year.

We understand that public health care success depends primarily on the organization of work of the primary units--the "Emergency Service" [Skoraya pomoshch] and the polyclinics. It must be said that there are still a lot of problems and concerns here, especially with the "OZ" [? guardian of health?] service. In order that it might indeed be rapid and qualified, three specialized brigades were created at the station: intensive care, cardiology and pediatrics. A direct telephone line was set up between the republic hospital and the department of internal affairs. Many factors that are not of only a purely medical nature reflect on the quality and specifically on the operations of the brigade. For example, numbering of houses, the way the streets are laid out, lighting in stairwells at night. These "details" sometimes become major obstacles to rendering effective medical help to patients. And the appropriate city services are trying to eliminate these obstacles to the degree that they are able.

However, we have still not been successful in substantially improving the work of the "emergency" ["Skoraya"]. The causes for this are many. One of them is a shortage of physicians. Whereas, as has already been noted, the personnel question has been solved for the city as a whole, we have not been able to keep a full brigade staff for the emergency service specifically. Physicians do not want to work there. And the situation is probably not so much one of the specifics of the work as it is of the organizational mess: insufficient transportation supply, poor quality of portable and stationary (in the vehicles) medical apparatus. All of this interferes with normal work. This is the basis for just criticism on the part of the patients and dissatisfaction on the part of medical personnel.

Myanizay devotes a great deal of attention to pediatric nutrition. Up to 7000 portions of highly nutritive mixtures are put out every day. We could get more, to help neighboring rayons. But the milk combine must be reorganized to improve its potential and, also, enough special vehicles would have to be provided.

There has long been a need to build a new maternity home in Shyauliyay and to rebuild a central women's consultation center. They are now crowded into cramped quarters that do not meet modern requirements.

Public health care is not the concern of the medical services alone. The administration, party and labor union organizations, womens' councils at enterprises, organizations and institutions, all render necessary aid to therapeutic and prophylactic institutions. It has become an irrevocable rule to analyze employee morbidity in labor collectives once a quarter, and to identify and rapidly eliminate reasons for traumatism. The number of workers exposed to conditions that are harmful to their health is constantly decreasing. The extensive propaganda work of the hygiene education center of the people's health university has been very helpful in this regard.

Constant attention to improving the health of the population gives gratifying results. For success in the All-Union Competition held last year, the Shyauliyay republic hospital collective was awarded the Temporary Red Banner of the USSR Ministry of Health and of the Labor Union Industry Central Committee; the city health department was awarded the Temporary ["travelling", non-permanent] Red Banner of the Central Committee of the Lithuanian Communist Party, of the LSSR Council of Ministers, the Republic Labor Union Council and the LKSM [expansion unknown, possibly the Lith. Komsomol] Central Committee; the city polyclinic was awarded the Temporary Red Banner of the Ministry of Health of the republic. These achievements and awards gratify the medical personnel and stimulate them to further improve their work.

12262  
CSD: 1849/699

## PERSONAL INSURANCE IN KAZAKHSTAN

Moscow FINANCY USSR in Russian No 3, Aug 83

[Article by N. V. Pushkarev, chief of the Kazakh Main Administration of State Insurance: "Development of Personal Insurance in Kazakhstan"]

[Text] Along with a sharp increase in production and improvement of the quality and assortment of consumer goods, the broad social-economic program called for by the 26th CPSU Congress stipulates the further development of personal and property state insurance of citizens.

Dealing successfully with the targets of the 10th five-year period, insurance organs of Kazakhstan have made a new stride in the development of voluntary insurance of the population. The plan for collecting premiums for the second year of the five-year period was fulfilled at 100.9 percent. More than 361 million rubles came in from personal insurance contracts alone. An important role was played by measures implemented by party, soviet, and trade union organs of the republic for improving local insurance work. Much effort was contributed by workers' collectives of the republic Main Administration of State Insurance, oblast and city administrations, and of course, state insurance inspectorates.

The life of Soviet citizens is improving from year to year, and personal insurance development indicators are rising correspondingly. In 1966, life insurance premiums for the entire country brought in 422 million rubles, while in 1982, they brought 353.4 million rubles in Kazakhstan alone. During the 10th five-year period, disbursements for all forms of personal insurance totalled 719.5 million rubles. To expand the group of insurance holders, it was necessary to conduct educational work among the population. Trained cadres were required, of which there were not enough anywhere in the republic for many years. Basically, they were amateur enthusiasts without specialized education. Now the republic's insurance system has 80.4 percent specialists.

A rapid pace of development of personal insurance in Kazakhstan was achieved during the 9th and 10th five-year periods.

As of 1 January 1983, 72.3 percent of blue- and white-collar workers, employees, and kolkhos members were covered by personal insurance, including 45.1 percent by life insurance. Ten years ago, life insurance coverage was only 14.2 percent.



and accident coverage 17.2 percent. During this period a constant increase in personal insurance contracts began. The number of life insurance holders in Turgay Oblast rose by a factor of 7.2, in Kokchetav Oblast by a factor of 3.9, in Semipalatinsk Oblast--5.7, in Taldy-Kurgan Oblast--4.9, and in Pavlodar Oblast--5.7. In eight oblasts of the republic, the number of insured citizens increased by a factor of 4-5. Before 1970, life insurance among the population of these and certain other oblasts was, one might say, in embryo. For example, in 1971 the Turgay Oblast, coverage was only 3.7 percent, in Kzyl-Orda--6 percent, in Chimkent--6.1 percent, and in Kokchetav--5.7 percent.

The state of affairs was somewhat better for accident insurance, and this coverage increased by a factor of 1.6 during the decade, almost uniformly in all oblasts of the republic.

Currently the growth rates of personal insurance in Kazakhstan are surpassing the average All-Union indicators. This has been achieved thanks to radical improvement of the work and increased personal responsibility on the part of every individual for the job entrusted to him. You become convinced of this, studying the work indicators of the leading State Insurance administrations and inspectorates of Aktyubinsk, East Kazakhstan, Dzhezkazgan, Karaganda, North Kazakhstan, Mangyshtak, Tselinograd, and other oblasts, which are achieving the highest level of development of personal insurance.

Against the overall background, the lagging of a number of insurance organs is especially noticeable. The republic's Main Administration of State Insurance has been forced to focus particular attention on their work. In Guryev Oblast, life insurance coverage of the population was 22.6 percent lower than average indicators republic-wide, in Kzyl-Orda--25.1 percent lower, in Turgay--26.8 percent lower, and in Chimkent--22.3 percent lower. In order to help the lagging insurance organs, workers of the personal insurance division visit 10 State Insurance administrations and 20-25 inspectorates annually. Practical help in reaching rural areas is achieved through specific recommendations which are set forth in semiannual and annual reviews, official letters and instructions, and publications generalizing advanced experience.

Accident insurance coverage is still low in Kzyl-Orda, Guryev, and Uralsk oblasts, and in Alma-Ata--it is 15-20 percent, while the republic-wide average is 27.1 percent.

On the administration level, the lowest indicators of personal insurance coverage are 49-48 percent, but in certain individual inspectorates--for example, Kiyiminskiy and Zhanadulinskiy rayons (Turgay Oblast); Karatobinskiy, Zakhaiskiy, and Chingirchanskiy rayons (Uralsk Oblast); and Kazalinskiy Rayon (Kzyl-Orda Oblast)--they are still no higher than 15-20 percent.

Existing reserves here are far from being fully exploited, especially in the rural districts of Uralsk, Kzyl-Orda, Guryev, Chimkent, and Turgay oblasts. In Zhanagulinskiy, Taypakskiy, Karatobinskiy, Chapayevskiy, Ordinskiy, and Akzhaiskiy rayons (Uralsk Oblast), accident insurance coverage is no higher than 6-8 percent. In waging the struggle against lagging, the republic Main Administration of State Insurance annually draws up targets of new contracts

for each state insurance administration. This has made it possible in a significant degree to bring the lagging administrations toward the average level of development taking shape republic-wide. In 1971, Turgay, Kokchetav, and Kzyl-Orda oblasts had a life insurance development level which was lower than the republic average by a factor of 2-3. Currently, this gap has been reduced to 1.7 in Turgay Oblast, 1.4 in Kzyl-Orda, and 1.2 in Kokchetav. It would be wrong to say that all administrations and inspectorates are coping with the intensive targets, but the laggards become fewer and fewer every year.

There are currently 298 personal insurance contracts for every thousand people. Every year, not only do the numbers of contracts and insurance holders increase, but also the insurance amounts. In the last seven years alone, the size of the insurance amount rose 20.7 percent per life insurance contract.

Taking part in nationwide socialist competition for an appropriate ushering in of the USSR's 60th anniversary, the republic insurance personnel collective found additional reserves and took on increased socialist obligations--to ensure revenues of 10 million rubles above the second-year target in voluntary insurance premiums. Of these, 6.5 million rubles were to be individual premiums. The actual amounts turned out to be 14.1 and 9.6 rubles, respectively.

The republic's Main Administration of State Insurance is primarily concentrating its attention on work in local insurance organs, and especially those where help is needed. Personnel of the Main Administration are analyzing insurance transactions, studying the level of organizational-mass work, holding seminars, organizing consultations, and taking part in preparing a number of organizational measures. Before going out on assignment, each representative of the central apparatus receives a precise and specific program for local action, taking into account the individual nature of a given insurance organ.

Children's insurance is gaining greater popularity in the republic every year. More than a million such contracts are now in effect. This work has become established best in Karaganda, East Kazakhstan, Kustanay, Semipalatinsk, Tselinograd, and Tselinograd oblasts, and in Alma-Ata. In the republic as a whole, the increase in children's insurance contracts was 9.6 percent for 1981.

But in a number of inspectorates, children's insurance is not getting the attention it should. As a result, in 1981 the number of contracts of this form of insurance decreased in the Ulytauskiy Inspectorate (Dzhezkazgan Oblast); Zhamanayevskiy Inspectorate (Semipalatinsk); Balykshinskiy, Gur'yevskiy, and Keyneuskiy (Mangystauk); and Syrdar'inskiy (Kzyl-Orda). The Algabasskiy Inspectorate (Chimkent) drew up only nine contracts, Kegenskiy (Alma-Ata Oblast)--11, Karabutakskiy (Aktyubinsk)--12, Kurgal'dzhinskiy (Tselinograd)--13, and the Talasskiy Inspectorate (Dzhambul) did not draw up a single contract in 1981.

A comparatively new type of insurance--marriage insurance--is causing greater and greater interest among the population. At the beginning of this year, there were 210,000 marriage insurance contracts in effect. Of these, 51,000 were contracted last year alone, an increase of 25 percent. Most of the contracts are in Karaganda, Kustanay, North Kazakhstan, East Kazakhstan, Dzhezkazgan, and Aktyubinsk oblasts. Managers of the insurance organs in these oblasts have conducted educational work among the population in a timely and skillful fashion, and are successfully continuing it.

Meanwhile, marriage insurance is still not receiving the attention it should in Alma-Ata, Guryev, Kzyl-Orda, and Turgay oblasts.

One of the problems which face republic insurance organs every day is providing for the continuation of existing life insurance contracts. Sometimes contracts are permitted to lapse because of inattentiveness of insurance personnel. Early termination of contracts decreased somewhat in the insurance organs of Aktyubinsk, Alma-Ata, Dzhambul, Dzhezkazgan, Karaganda, Pavlodar, Taldy-Kurgan, Chirchik, and other oblasts, as well as in Alma-Ata.

In connection with the increase in personal insurance contracts, the work volume and the responsibility of medical-insurance examiners are increasing. This is well attested by the increase in the amount of disbursements. In 1982 alone, the republic population was paid 239.8 million rubles under personal insurance contracts, which more than doubled the amount of 1976, for example. This obliges medical examiners to be more flexible in giving their decisions and at the same time strictly observe insurance legislation. The quality of the examination and the conclusions of the medical-insurance examiners form the cornerstone for settling all matters of insurance payments for labor disability which determines the grounds for payment. Unfortunately, not all insurance organs take care of this. Because of poor handling of medical examination work, individual administrations of State Insurance have permitted instances of unjustified refusals as well as improper payments, which has caused citizens to complain.

In some oblasts there is still inadequate monitoring on the part of State Insurance administrations of the activity of medical-insurance examiners. Taking advantage of this laxity, certain medical workers have been able to falsify documents for the payment of insurance sums.

In Petropavlovsk, documents were submitted concerning five injuries sustained by V. I. Red'kin, head of the polyclinic at City Hospital No 1. Deliberate alterations were made more than once in the records of his outpatient chart in the polyclinic. In reality, as investigation established, no injuries had occurred at all. V. N. Red'kin received 1295 rubles illegally; the final payment--250 rubles--was only prevented in the course of the investigation. Assessing the state of affairs in a principled manner, the North Kazakhstan Oblast Health Department relieved of their duties the medical personnel who were guilty in this case and other machinations. The insurance workers who permitted the negligence and unscrupulous acts were punished.

The republic's Main Administration of State Insurance attaches most serious significance to the question of reinforcing the monitoring of the work of medical examiners and the safekeeping of funds. Seminars and conferences are being held with medical examiners. Physicians of the main administration, participating in audits of insurance organs, are not only checking the work of the medical examiners but also giving them serious practical aid.

Republic insurance organs are implementing measures for further adoption of machine-processed insurance information using computers. The number of personal life insurance accounts processed on electronic and card-punch computers has risen above 800,000, or 28.4 percent of the total.

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## ENGINEERS AND PHYSICIANS UNITE THEIR TALENTS

Kishinev SOVETSKAYA MOLDAVIYA in Russian 20 Aug 83 p 3

[Article by A. Romodanov, hero of socialist labor, academician of the Ukrainian SSR Academy of Sciences and director of the Kiev Scientific Research Institute of Neurosurgery and Yu. Drozdov, doctor of technical sciences and head of laboratories at the Scientific Research Institute Machine Building]

[Text] Consistent improvement of the quality of medical service for the population is one of the most important tasks of our health service. In resolutions of the 26th Congress of the CPSU which follows decisions of the Communist Party and the Soviet government, and extensive plan to improve medical service in our country was outlined.

Among the most important measures to combat serious ailments, the diagnosis and treatment of a disease such as epilepsy occupy a significant place.

The severity of this illness is well known. At the same time, existing methods of conservative therapy in many cases prove to be scarcely effective. This is when the necessity of neurosurgical operations arises.

Years of research have shown that the development of this illness, as a rule, begins with minor injuries to sections of the brain. The success of surgical intervention depends completely upon how precisely this area is determined and how fully it is removed. This task is extremely complicated. Injured sections could be located in remote structures of the brain next to vitally important focal points. In addition, one patient may develop certain secondary focal points, the removal of which not only will not save the patient from this illness, but, on the contrary, may lead to severe complications. A qualitative examination of this group of the most severe patients is possible only with the aid of special stereotaxic surgical procedures, which guarantee very precise insertion of diagnostic and therapeutic instruments into the injured sections of the brain, these special procedures guarantee proper dosages and times for disconnection of the instruments. However, the stereotaxic method has not been widespread due to the lack of special technical methods and accelerated methods of diagnosis and prognosis of epilepsy.

In our country and abroad, separate stereotaxic apparatus and equipment have been developed and created; however, basically, they were intended for surgical treatment of other nervous system illnesses and by far not always corresponded

to requirements of surgical epileptology. Moreover, a large volume of diagnostic information has required automation of the diagnostic process of the epileptic focal point. It was possible to solve these complex problems only with the collaboration of physicians and technicians.

Moldavian psychiatrists and neurosurgeons, jointly with scientists and specialists of the department of machine parts, automation and telemechanics of the Kishinev Polytechnic Institute imeni S. Lazo created a modern system which guarantees the introduction of the stereotaxic method of diagnosis and surgical treatment of epilepsy in health service institutions of the republic.

A diagnostic system has been created which allows one to clarify the reason for the onset of epileptic attacks and to determine the zone of injury in the brain. The system guarantees precise insertion of diagnostic instruments into pathological zones of the brain.

In addition, study has been made of technical and mathematical ways to provide medical-biological research on deciphering the processes occurring in deep structures of the brain, structures involved in the epileptic process. On the basis of spectral and factorial analyses, researchers have produced models of dynamic processes during illness and they have succeeded in solving a system of integral equations which reveal the structure of the epileptic process.

The stereotaxic system for diagnosis, prognosis and surgical treatment of epilepsy is practically applied in the facilities of the specialized neuro-surgical department. With the goal of revealing foci of the illness, a complex examination was conducted on more than two thousand patients and 135 operations were performed; in two thirds of the patients a positive clinical effect was noted. The introduction of the stereotaxic complex into clinical practice has allowed the application of an entire series of highly effective treatment-diagnostic procedures. Further improvement of the developed procedures and methods will enable us to strive for an even greater effectiveness in combating this serious ailment.

The work of this collective of authors (V. I. Mudryak, P. V. Beshlyaga, A. A. Bokhanastyak, M. Ya. Zinyak, A. S. Iova and K. M. Sakare) has merited a gold medal at the USSR VDNKh [Exhibition of the USSR National Economic Achievements] and other union and foreign exhibitions and was rightfully nominated for the competition of the USSR state prize in the field of science and technology.

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## BRIEFS

HOSPITAL SHORTCOMINGS AGAIN CITED--In October of last year, our Group of People's Control of the Zol'skiy Rural Soviet investigated the operations of the uchastok hospital where L. Monako is the chief physician. Enough shortcomings were observed there that a formal document was drawn up and sent to the Rayon Committee for People's Control. A month later an article was published in the rayon paper SERP I MOLOT on the results of the investigation. It spoke briefly of the shortcomings observed by the group. The hospital and polyclinic premises have long been in need of maintenance, and the medical equipment leaves much to be desired. Back in 1981 the hospital acquired a new x-ray machine at a cost of 24,000 rubles. However, due to the mismanagement of the chief physician it stood in the open air for 2 years and was then sold to the Kommunisticheskiy Mayak Kolkhoz. New apparatus was bought with money received from the kolkhoz, but once again it stood in the hospital courtyard and the village residents had to go elsewhere for x-ray examinations. Patients were not given good care in the hospital; drug and food supplies were kept track of in a wretched manner. There were also a number of complaints on the work of the medical personnel, particularly on the quality of physician care. Disruptions in the schedule of operations were tolerated in the dental and dental hygiene offices. All of these claims, however, did not elicit any reaction on the part of the hospital administration. The complaints and suggestions book is unattractive; some of its pages have been ripped out altogether. It must be said that Chief Physician L. Monako is doing everything that she can to hinder the work of the patrol. She has expressed her dissatisfaction in crude form, condemning one of the group members, hospital worker M. Shevchenko for "allowing himself to take his argument out of the house". She suspended him from his job on the day following the investigation. After the article appeared in the rayon newspaper, L. Monako sent a rebuttal to the editor. A new commission arrived, this time from the Rayon Committee for People's Control. The shortcomings expressed in our document were corroborated, and new facts were uncovered which were not at all flattering to the hospital workers and its chief physician. Then, at the beginning of this year, representatives from the Rayon Committee for People's Control, the Central Rayon Hospital and the Rayon Health Department came once again. They came to the conclusion once again that the facts correspond to reality. In addition a raykom party employee came to us and spoke for a while with members of our group. And then everything quieted down, as though there had been no upset at the hospital. The chief physician's persecution of Shevchenko and the surgeon Arnazarov, who had helped us to see the shortcomings, intensified at this point. We then wrote a letter to SEL'SKAYA ZHIZN', and again the commission arrived, this time all

the way from the Kray Center. The facts--how many times!--were corroborated and no conclusions were reached. Those guilty of mismanagement were not punished; order, or more properly the lack of order, in the hospital remained as before. It is for this reason that we ask you to publish our letter in the newspaper. Maybe this can restore order. [By L. Bondarenko, I. Grushevskiy, A. Zolotarev and M. Shevchenko, Members of the Group of People's Control, Zolskiy Rural Soviet, Kirovskiy Rayon, Stavropol Kray] [Text] [Moscow DEL'SKAYA ZHIZN' in Russian 4 Sep 83 p 2] 12262

PUBLIC HEALTH SEMINAR--Preventive medicine sanatoriums [sanatoriya profilaktoriya] are acquiring increasing significance in the health of workers. There are 145 of them in the republic. The network of labor union sanatoriums for workers with children is growing rapidly and the quality of their service has improved. This was discussed at a seminar and conference of chief physicians from preventive medicine sanatoriums of the republic held on 15 August in Alma-Ata. Chairman of the Kazakhstan Trade-Union Council K. T. Turysov spoke on improving the effectiveness of worker health in light of decisions of the June (1983) CPSU Central Committee Plenum and on a speech given there by CPSU Central Committee General Secretary Comrade Yu. V. Andropov. Unfortunately, in a number of oblasts, therapeutic and prophylactic operations are still not well established, and the collectives of light industry and the rural structure are not adequately provided with sanatoriums. Possibilities for sending patients to a dispensary are not being fully utilized. Those assembled exchanged experiences and mapped out measures for improving operations. Representatives of party and soviet organs, and of a number of ministries and agencies of the republic were present at the seminar/conference. [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 16 Aug 83 p 3.] 12262

CHILDREN'S HEALTH EXPOSITION--In the "Health in the USSR" pavillion a multiplan thematic exposition devoted to pediatric health is being held. Materials on stands and natural exhibits reflect the organization of the multifaceted pediatric medical service in our country. It is useful to study the experience of the Belorussian SSR in rendering efficient medical care to children in a rural locale. It is here that ASA [Automated System of Administration] was first developed and put into practice in our country, for daily control over the dynamics of pediatric disease during the first year of life. Information is transferred from the village feldsher-midwife point through the rural medical uchastok to the pediatric department of the rayon hospital and that same day is fed into the Belorussian SRI [Scientific Research Institute] for Mother and Child Care and also into the republic Ministry of Health. ASA makes it possible for medical care to be quickly rendered by highly qualified specialists when the need arises. The experience of Kirghizia where preventive medicine for children in a rural locale is administered by traveling consultants, was reflected also at the exposition. Approximately 60 scientific institutions and departments from medical VUZes and hospitals and other organizations are participating in the exhibition. [Text] [Moscow DEL'SKAYA ZHIZN' in Russian 4 Sep 83 p 2] 12262

## PATIENTS AND SCHEDULES

Moscow MOSKOVSKAYA PRAVDA in Russian 9 Aug 83 p 2

[Article by R. Nazarova, head physician of polyclinic no. 75 of the Babushkinskiy Rayon]

[Text] Quite recently, a physician's visit during work time was considered natural. Polyclinic workers, our patients and we, along with enterprise and institute managers who had to let co-workers go to the polyclinic became accustomed to this. It happened like this because our specialists worked the same hours as these enterprises.

In the beginning of this year, the work system was changed in our polyclinic as in all others in accordance with instructions of the Main Administration of Health Services of the Moscow gorispolkom. Now the polyclinic is open until 9:00 PM instead of 8:00 PM. And it isn't only the addition of this hour. The fact is that now from the start of work, that is from 8:00 AM, until closing time, uchastok therapists are still receiving patients. Their work is organized in three shifts, according to a so-called sliding-scale schedule. "Narrow" specialists work two shifts.

It has been noted that most often patients are sent to the polyclinic on Mondays and Fridays. This was given consideration when rational schedules were being composed. On these days, the time in which the patients are received at the polyclinic was increased one hour. In the uchastoks in the DEZ [expansion unknown] and in health rooms, it is explained to the people in the polyclinic over local broadcasting that it would be better for elderly people, if they are not seriously ill, to come for their physician visit on Tuesday, as there would be less visitors. And on Monday, it is better for them to give analyses, because the procedure will go on more quickly. In this way we will attempt to regulate the flow of patients. It is not only convenient. It is also very important to enable polyclinics to gradually transfer to a continuous preventive dispensary system (dispensarization) for the population, as is required by the resolution of the June (1983) CPSU CC plenary session. On the days when there are fewer visitors, time is set aside in the schedules for the preventive dispensary system. As a rule, this is during evening hours, since then it is not necessary to take patients away from work.

Special attention is allotted to prophylaxis of chronic illnesses. For example, it is known that in the spring and fall, diseases of the gastrointestinal tract become more aggravated, in unstable weather the condition of high blood pressure patients grows worse and in cold weather the condition of patients suffering from catarrhal diseases worsens. And of course, it is worthwhile to conduct the preventive dispensary system for these patients at just this time, that is, when their ailments are more expressed. But it is also necessary on dispensarization days to plan time for reception of people with acute illnesses.

The staff schedule has also been changed. Formerly, in the evening hours, there were three staffs of physicians on duty. Now, instead of them, we have three staffs of uchasok therapists. And, in the evenings, it is not the physician on duty who goes out for calls, but the uchasok therapist who is on duty on that day. What has this done? In the first place, it has lightened the load of each uchasok physician, which means that he or she is able to attend to every patient more thoughtfully and seriously. In addition, a portion of the evening call outs could be in the same uchasok of the uchasok physician himself. This means that the physician is visiting a patient whom he knows well. On the next day, the person on duty informs his or her colleagues who will continue treatment about the call outs.

Here, apparently, it is necessary to also speak of those changes which have occurred in rendering service at home. I do not think everyone realizes that it is provided on Saturdays and Sundays from 9:00 AM to 11:00 PM. The time of analysis reception has also been extended. Whereas, formerly, laboratories only worked in the morning, now some analyses (not all are possible according to medical indications) can be done in the morning, afternoon and evening, that is, when there is time off from work. Owing to rational schedules, it has been possible to organize patient reception by all specialists on Saturdays.

Every week, specialists of the Moscow Medical Stomatological Institute serve as consultants for the most complex therapeutic and surgical patients. This allows for the usage of the most up-to-date methods of diagnosis and treatment. A modern polyclinic, even more so a large one like ours, is able to conduct simple operations with its forces, under ambulatory conditions. Thus, recently the number of patients sent to the hospital for operative treatment has been reduced 10 percent. What caused this to happen? First of all, it is due to the fact that operations such as the removal of polyps, adenoids, small tumors and others are conducted by our specialists under ambulatory conditions. Usually there are 700-800 operations a year. Moreover, all necessary analyses are done in the polyclinic itself. And it certainly is no secret that if analyses are done quickly and in time, the number of disability days is lowered. This is because treatment begins more quickly and is conducted more successfully. If, on the other hand, a person still must have hospital treatment, they go to be sent there, completely examined. This means that his time in the hospital bed is shortened and the treatment itself proceeds, as a rule, without complications.

I shall return to ambulatory operations. Formerly, they were also done by our surgeons, but the time for this was not specially set aside. And the operation, even the simplest, did not proceed quickly. Therefore, lines gathered at the door. This made both the physicians and the patients nervous, which, of course,

negatively affected treatment. Now, we have set aside special operation days according to our new schedule. Each occurs at appointed hours. The physician works peacefully. Excited patients are not crowding at the doors.

There is also no crowd at the registration window. As in all polyclinics of our city, the physician's patients sign themselves in. Patients arrive at the time appointed in lists of their own recordings. Medical cards are selected according to these lists. Now, there is a minimum amount of visitors at the registration window--only those who require immediate reception. There are always special orders for them.

The usefulness of the new work order is obvious. It not only saves the patients' time, but also enables the work of the polyclinic to be varied. For example, in the summer, significant prophylactic work is conducted. In addition, the new schedule creates a time reserve for the physician to conduct conferences sanitation clearance work and formulation of medical documentation.

At the same time, everything still does not proceed smoothly. We also have problems which occur. We intend to question patients soon, to better understand their relation to the new schedule. And if required, changes will be introduced. The public Control Group which regularly conducts raids to verify if lists of self-records are placed in specialists' folders on time, if orders for acutely ill patients are transmitted to the registry and if physicians are carrying out the rational schedule, must operate more actively. Now, all noted infractions are discussed at party bureau conferences. Paid reports are made known publicly; announcements are hung on the board and the party organization of the polyclinic continually keeps track of the fulfillment of the new work schedule.

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## QUALITY OF RURAL MEDICAL CARE DISCUSSED

Ashkhabad TURKMENSKAYA ISKRA in Russian 24 Aug 83 p 2

[Text] Ashkhabad, 24 Aug (TURKMENINFORM) -- The status of medical services for animal husbandry workers in remote grazing areas of Krasnovodsk Oblast was discussed at a meeting of the Health Care and Social Security Commission of the Turkmen SSR Supreme Soviet, held on 22 August in Ashkhabad.

L. M. Ganichev, a speaker at the meeting and deputy chairman of the Krasnovodsk Oblast party committee, and several of the deputies who spoke at the meeting noted that specific work is being done in the oblast to improve medical services for animal husbandry workers. The rural population is served by 137 different therapeutic and preventive care institutions; and mobile out-patient clinics are operating in various rayons. The oblast health department has developed a comprehensive plan for providing medical and hospital care to animal husbandry workers in remote districts; and organizational and methodological measures in this direction have been outlined. Steps are being taken to strengthen the material and technical base of health care institutions and to provide them with medical personnel.

Even so, serious shortcomings have been noted in the medical services for animal husbandry workers. In-depth preventive care examinations of the workers, especially x-ray examinations, are not performed extensively enough. There is also inadequate provision of preventive care observations and treatment. Deadlines for examinations of patients in the preventive care facilities are not observed. At many medical institutions there is no control over the schedules according to which specialists are to travel to remote grazing areas. No one analyzes the results of these trips.

The organization of anti-epidemic measures can also be criticized. Sanitary and hygienic services do not correspond to contemporary requirements. Work with personnel is in need of significant improvement, as is the material and technical base of rural medical institutions.

The TuSSR Ministry of Health, the Krasnovodsk Oblast party committee, and local councils of people's deputies are not giving enough attention to the work of the oblast's rural medical and preventive care institutions in terms of the medical services provided to animal husbandry workers and members of their families in remote grazing areas. Little practical assistance is given to medical institutions in this direction.

The Commission recommended that the Krasnovodsk Oblast party committee and the TuSSR Ministry of Health take concrete steps to eliminate the existing shortcomings in the work of the medical institutions serving animal husbandry workers.

A corresponding resolution was adopted.

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## NEW MEDICAL FACILITIES DESCRIBED

### Children's Gastroenterology Center

Moscow VECHERNYAYA MOSKVA in Russian 27 Aug 83 p 2

[Article by B. Samoylov]

[Text] People from various parts of the city--from Chertanov and Troparev, Medvedkov and Cheremushki--come to this building on 13th Parkovaya Ulitsa, to the children's consultation, diagnostic, and treatment center for gastroenterological disorders.

When L. N. Galushkina, the center's director, was going to make the rounds of her "domain", I asked if I could join her. When she was showing me the offices where the physicians see patients, she did not fail to emphasize that "Scholars from the propaedeutic department for children's diseases at the 2nd Medical Institute, specialists from children's rayon polyclinics, and from Children's Hospital No 3 (of which the center is officially a part) join forces at our center. In addition to the therapeutic work done here, we also train pediatricians in various areas of specialization. The center is also involved in incorporating scientific achievements into the work of children's treatment and prevention institutions; it organizes the assistance provided in the city to those suffering from gastro-intestinal ailments; and it develops comprehensive preventive and sanitation programs to reduce the incidence of such illnesses among children."

We enter one of the offices. A physician is sitting behind a desk, and across from him is a seven-year boy with his mother. Apparently his illness has reached its peak: one is struck by the boy's pallor, and his sad expression, unusual in one so young. The physician is questioning the boy in detail about his symptoms, then they go into the next office that has on its door a sign that says "Endoscopy".

Diagnostic studies are performed in this small room. With a few accurate, practiced movements, the endoscope tube is inserted into the stomach. A physician with the still unfamiliar title of "endoscopist" leaned to look into the instrument's eyepieces; he looked for several minutes and moved the little adjustment levers. He says, "Gastritis". The patient leaves the room after fifteen minutes. A new note is entered on his chart. It is very important.

The question mark that had been written under the "diagnosis" column has been removed. Now treatment can begin.

Lidiya Nikolayevna says, "The word 'endoscopy' means 'to see inside'. Endoscopy makes it possible to get an idea about the condition of the organ being examined. The method is safe and accurate; it can be used on patients of all ages; and often we can make a correct diagnosis by using it alone. What's more, before the invention of the endoscope, an ailment such as a polyp in the large intestine could not be examined directly except during surgery. Now a polyp can be examined without having to resort to the scalpel.

"Incidentally, polyps in the large intestine are now removed without the traditional surgical instrument. The surgeon now uses a fibroscope--a member of the endoscope family. A special loop is attached to the instrument. It is slipped over the base of the polyp, it tightens around it, and it cuts it off by means of an electrocoagulator. The whole procedure takes about 15-20 minutes, and it can be done on an out-patient basis."

We continue our conversation on the study of gastro-intestinal tract organs in a laboratory. Little children are lying on couches in the large, bright room. They have rubber tubes in their mouths; the other ends of the tubes empty into test tubes.

"We are studying the gastric secretions. The level of the secretions is important in choosing the proper treatment and in taking preventive measures," notes Dr. L. N. Galushkina.

We return to Lidiya Nikolayevna's office, where the director answers some of my questions.

"What was the reason for creating this center?"

"The incidence of digestive system disorders among children has increased recently. Disruptions in regular dietary patterns, living on cold food, stress on the nervous system caused by growing tensions, and a sedentary lifestyle, all lead to a disruption of the organs' normal functioning, and to various illnesses. Therefore it became important to organize specialized medical service.

"The specific nature of diseases of the digestive organs requires, as you have seen, special, and sometimes complex, methods of diagnosis and treatment, with which physicians in other specializations are not sufficiently familiar, as a rule."

"Today a great deal of attention is being given to providing preventive care for children. What does this involve when dealing with gastroenterological diseases?"

"The preventive care system is in essence a process that combines treatment, prevention, sanitation, and educational work with the aim of strengthening the children's health. Active, regular, medical observation of the children's health is being instituted. Each child, if necessary, is examined by various

specialists; this makes it possible to detect the ailment at an early stage, and to determine its dynamics and take prompt measures. The preventive care system often makes it possible to return children to health without using any medicines, but by outlining a special program of exercises, rest, and diet."

#### Health Center for Transport Workers

Moscow VECHERNYAYA MOSKVA in Russian 30 Aug 83 p 1

[Text] Parkovsko-Glebovskiy Park, which occupies a vast area in the northwest part of the capital, is a favorite relaxation spot for Muscovites.

In the western section of this vast green area, a medical complex is being erected for river and marine transport workers. The outlines of all its buildings and structures can already be seen clearly. The center is being built by the collective of the 78th administration of the "Mosstroy-17" Trust, together with subcontracting organizations. The technical specifications were developed by the design collective of the Planning Institute of the RSFSR Ministry of Health.

There will be 5 main buildings here and 2 auxiliary ones. The area of the new center is about 5 hectares. The main building is a 9-story medical facility with several departments: a therapeutic and diagnostic department; two surgical departments; a urological-neurological department; a cardio-rheumatological department; and others.

In a separate 5-story building there will be a polyclinic that can accommodate 500 visits per day; and a conference hall. It will be equipped with a film projector, modern equipment, and comfortable seating.

Visitors will be able to use modern video-telephone equipment in the hospital lobby. An information desk will also be located there.

All the buildings now have their roofs completed. Finishing work is now being done on the polyclinic.

9967

CSO: 1849/702



## THE DZIGIT ZELENYA

Moscow IZVESTIYA in Russian 21 Jul 83 p 3

[Article by A. Kazikhanov, Izvestiya correspondent and O. Tsagolov, correspondent for the newspaper SOTSIALISTICHESKAYA OSETIYA. Cities cited are Na'l'chik, Ordzhonikidze and Groznyy]

[Text] A letter arrived at the correspondence station of IZVESTIYA. Everywhere we went, wrote its authors, residents of Groznyy, that the output of pharmaceuticals increases from year to year. But for some reason, even the simplest drugs are not available in pharmacies in our city....

We read this letter. And at first, to tell the truth, we doubted it: weren't the authors mistaken? Right there on the table were official letters we had just received from the pharmacy administration of Checheno-Ingush in North Ossetia. The medicine supply, they said, was normal. There are no disruptions in pharmacy operations.

Who, then was correct? Very well, we decided, we shall take a walk and there we'll decide what the situation is.

We stepped outside and...we noticed a crying boy of about five years. He had hurt himself, and a fresh scratch was turning red on his knee. The boy's lean, slender grandfather in a mountain papakha [Caucasian hat] admonished him in a low voice. "It doesn't become a Djigit [skillful horseman] to cry" said he, "we'll go into the pharmacy now. And if we're lucky, we'll buy zelenka [green liquid in alcohol which is rubbed on the skin for a healing effect]..."

We were surprised: what else but zelenka....And we entered pharmacy no. 90 of Groznyy, right behind grandson and grandfather.

"Zelenka? We usually don't have any..." pertly answered the girl in a snow-white coat behind the counter. We also asked for zelenka and citramone. What do you mean, we were told, it is difficult to get zelenka, but in general we never have citramone.

This "no" was beginning to resemble a bad dream. We presented our identification and were allowed in to see V. Yefimova, manager of the department of prepared medicines.

"What is going on?" we asked. "After all, according to the statement received three days ago, you must have a complete inventory."

In answer to this, the wonders began: in the bowels of this "subsidiary", 90 bottles of zelenka, nonsaleable bottles of penicillin and a mine of citramone are discovered. Right there with our own eyes we saw cotton wool, baby powder and ascorbic acid. Everything that is requested in vain in the stores. What was going on? No answer ensued.

The next pharmacy we came to was no. 40. We won't bore the reader: there were the same empty counter and the same riches under the counter. It is true, the pharmacy's manager, A. Devniev, was more resourceful than V. Yefimova. "We are holding back citramone," he said, "for war invalids."

"And 72 thermometers," we said, "are they also for them?" After that, the manager fell silent and became morose.

We went from pharmacy to pharmacy. There was not, it seemed, a deficit of citramone at all. But then just try, and in Groznyy you won't find a trace of it. But now we know where to look for it--under the counter. And everytime we found it, and at the same time we also found rims for glasses, nitroglycerin and much more.

Medicines do exist, pharmacies receive them. But they hide them from shoppers. When we shared these impressions with N. Ul'bieva, the manager of the Checheno-Ingush pharmacy administration, she was very offended by the word "hide". "We are not a business," she explained to us, "and we have completely different rules." N. Ul'bieva unfolded order no. 175 from February 25, 1982, in front of us. And there was a direct order not to place deficit medicines in the pharmacy window. We peered more closely at this document. And we read: "Place pictures in the pharmacy windows only of those medicines, herbs and mineral waters which can be obtained without prescriptions from a physician." Yes, but really, all of the medicines we found under the counter can be dispensed without prescriptions! And there was never a deficit of them....

When we fished out a book on the table by D. Sinev and I. Curevich, titled "Methods for Pharmacy Apothecaries" published MEDITSINA, 1983 and we turned it to the necessary page, where the authors point out that pharmacies carry out both production and trade functions.

Thus, we must say, toppled the logical structure of comrade Ul'bieva. Now no one attempted to place a theoretic foundation under the absence of order and calculation in pharmacies' operations.

Our newspaper (no. 112, 1974) published the correspondence "Tablet under the tongue". It dealt with the fact that in pharmacies of the city of Ordzhonikidze, a vitally necessary medicine such as nitroglycerin is not available. It was also about the "approximate" approach to the composition of orders for medicines and about the great surplus of some drugs. The absence of operating control of the traffic of medicines was discussed.

Soon the editors received an answer. In it the USSR Ministry of Health informed us that serious measures had been mapped out for the improvement of pharmacy operations, the adjustment of calculations and control of the traffic of medicines. We will return again to these problems. But now we will say this. Then, nine years ago, special permanent commissions were created to better control pharmacy operations.

Here we have in front of us a statement on the work of one of these commissions. We will say right away that the account is wonderful. They regularly check pharmacy operations and conduct joint conferences of physicians and pharmacologists. Information about the presence of necessary medicines is improving. They are studying the population's requirement for medicines....

On paper it is better than ever before. Here, for example, is only one indicator from the account: in pharmacies, the percentage of rejection of medicines has decreased sharply. In the first quarter of this year, there were only two percent rejections in North Ossetia. And in Checheno-Ingush--just over one percent.

But really, we are discussing the same pharmacies where one cannot purchase the simplest items! Moreover, many medicines are actually available in restricted quantities, and demand for them is not completely satisfied. Then who needs a great inventory on the pages of statements?

Among the tasks of the permanent commissions was the following: erase the "boundaries" imposed among pharmacies. But it is notable that, erasing them on paper, the commissions favorably looked upon the creation of every type of stock in pharmacies: for different groups of patients, separately for polyclinics and for sanatoriums.

Uncontrolled supplies have grown up everywhere. How many medicines have been taken from them, how many were insufficient, it is impossible to know. In pharmacy no. 67 in the city of Ordzhonikidze, shelves were chock-full of deficit medicines for the sanatoriums "Redant" and "Ossetia". In the Pharmacy no. 10 in Grozny were nonsaleable items for the central stomatological polyclinic and Eighth city hospital. Pharmacies are turned into warehouses, just as in treatment institutions themselves there are, incidentally, special facilities for preserving medicines. "Our subsidiaries have been calculated in accordance with an order of the USSR Ministry of Health, only for a ten day supply of medicine," Yu. Britais, the head physician of Groznetskaya Hospital no. 4 said to us, "we cannot take more."

Maybe it would be better to save the entire supply which is not claimed from hospital pharmacies in the main warehouse of the Republic Pharmacy Administration? But then, there are also instructions there which prohibit holding medicines of treatment institutions in this warehouse.

But couldn't they take upon themselves the role of intermediate link of inter-hospital pharmacies?

In the capital of North Ossetia, there is only one such pharmacy. The Council of Ministries of this republic planned to construct a new inter-hospital pharmacy in Ordzhonikidze. However, this decision remained on paper.

But then, in Groznyy, there are three such pharmacies. And another five have been introduced into the system of treatment-prophylactic institutions. This is more than enough. But then why are medicine stocks of hospitals here also kept in city pharmacies? Isn't it because it is so much more difficult to adjust the account, and easier to instill confusion?

Central permanent commissions which are subordinate to health ministries take medicine supplies into account when they are transferred to pharmacies. And, further...further the thread of control breaks. This is one of the public commissions of the city of Ordzhonikidze. Polyclinic no. 4, pharmacy no. 67 and two sanatoriums--"Kavkaz" and "Ossetia" are in the region of its operations. N. Kravtsova, chairwoman of the commission and assistant to the head physician of polyclinic no. 4, was extremely surprised when we related to her the fact about the carelessness displayed by physicians in charge of sanatoriums revealed by the BKhSS [abbreviation unknown] of the Ministry of Internal Affairs of North Ossetia, and also about medicines stored in pharmacy no. 67.

We remain interested in the composition of the commission. It includes directors of treatment-prophylactic institutions. For whom do they distribute medicine? For themselves. Whom must they control? Themselves, and people to whom they actually depend. Which is to say, the situation....

Let us now return to the facts. Here is what was contained in the resolution of the North Ossetian party obkom bureau: "In treatment-prophylactic institutions...documentation which regulates the accounting of deficit medicines is conducted with infringement of rules; there are no records of the accumulation of deficit drugs. In Alagirskaya and Mozdokskaya rayon and city hospitals, patients did not receive medicines which were at that moment in the hospitals. Often, patients in hospitals buy medicines which are in the hospital pharmacy on the side, while doctors write prescriptions for medicines to people who really do not need them...."

And members of the public commission are not aware of all of this. But how exactly what kind of commission is this?

The timing of treatment and its timeliness depend upon how pharmacies operate. What kind of treatment process can one speak of, if the patient must wait for medicines for several days not only for scarce but also for the "common" medicinal items? This is a direct harm to one's health and a moral punishment. Another harm began to become accustomed to the fact that a pharmacist who is more popular than in a pharmacy is offered in a crowd where it is scarce and human suffering itself characterizes become rich.

Let us now again return to the official reply from the USSR Ministry of Health to our correspondent "Tselist under the Tongue". The head of the Main Administration of Medical Services, N. Glyuk, wrote ten years ago that there would be no question of the arrest of medicine traffic with the application of existing measures, on account of their limited and redistribution.

Thus, in the reply, they had checked-in on us kind. But then time passed, and there could be no question in the primary administrations of either this or other patients (because of the lack of medicines).

There are central controllers' offices in pharmacy administrations of those republics. There must be reports there on where to find the necessary medicine. When we returned in Grozny to such a controller's office, they had "not heard" there that in Pharmacy 46 there is a surplus of citramone and thermometers. And in a neighboring pharmacy, where we would have gladly taken them, they also had not heard of this. Customers also are not aware of anything.

Informational work of pharmacies and pharmacy administrations, unfortunately, is somewhere on the level of the past century. And, yet, meanwhile, in the republics we have been discussing, information-computer centers do exist. Systems of electronic computers exist in the very same North Ossetia and Dagestan-Ingush. Most often, about a third of their capacities is used. And as to the pharmacies--or from the pharmacies to them?--the hands do not reach....

However far agriculture is from pharmacy affairs, an interesting parallel emerges itself. In the "Agricultural Equipment Association", a constant deficit of parts has never existed. Each farm, not depending upon suppliers, collected general supplies. Whether it is necessary or not--grab it and save it. As a result, some regions could not start their combines because of a lack of the determined number of bearings, while the others who did have it waited for what was going about at the neighbor's. And now there is a delay in the system of supplying parts and they are recorded with the aid of "agreements".

Pharmacy control services, with the republic Ministry of Health and the pharmacy Administration--did themselves verify any time where and which goods there are in surplus at a given moment. And they could effectively clarify why in a certain pharmacy they are refused citramone or nitroglycerin. And they could quickly correct the situation. And until this is done, it is difficult to speak in order.

Of course, operations are not carried on the back, the USSR's expansion continues. In the past six months in markets of the village of Dagestan and the city of Grozny, several people have been arrested who sold artificial diamonds at a very high price. In this, alas, does not solve the problem. While the false marketing continues and people go to the speculation. They are taken to jail. After all, in the marketplace there is an artificially created deficit.

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## ANNUAL CHECK-UPS OF ENTIRE POPULATION WITH USE OF COMPUTERS

Riga SOVETSKAYA LATVIYA in Russian 31 Aug 83 p 2

[Article by G. Popov, chief, Therapeutic and Propylactic Care Administration, Latvian Ministry of Health and S. Solomonov, head of the Department of Didemography and Preventive Dispensarization of the Population, Riga Medical Institute: "The Computer Helps Prevention"]

[Text] Preventive medicine has rich traditions in our country. The still-famous Russian scientist-therapist M. Ya. Mudrov wrote: "To take healthy people into his hands, preserve them from hereditary or impending diseases, and prescribe for them the appropriate way of life is honorable and restful for the physician. And it constitutes his first obligation."

The principle of preventive medicine is the foundation of public health in socialist society. This is manifested most clearly and specifically in the system of preventive dispensarization of the population. In our country there are now tens of millions of people under preventative dispensary care: children in day care centers, preschool, and grade school, college students, workers in a number of sectors of industry, and many categories of ill people.

But part of the population is still not covered by the preventative dispensarization system. According to sociological studies, about 30 percent of the inhabitants have not sought medical aid for an extended length of time. Timely preventive examination of such people and subsequent transition to preventive dispensarization would protect them from disease and premature loss of working capacity.

The party and government consistently devote great attention to developing Soviet public health, raising its quality, and improving preventive work. In his speech at the June 1983 Plenum of the CPSU Central Committee, CPSU Central Committee General Secretary Yu. V. Andropov emphasized that prevention of disease deserves special attention, and that one of the ways to achieve this is the introduction of annual dispensarization for the entire population. The Union's stated task of conducting annual dispensarization for the entire population is extremely responsible and complex. It is an important stage in the development of Soviet public health. The creation of a "Program for Yearly Dispensarization of the Entire Population" has been called for.

Resolving this task which is so important both in the social and the economic plan will demand intensive work from public health organs and establishments and all medical personnel in a unified program for comprehensive annual preventative medical examination of the population.

Medical workers of Soviet Latvia fully understand the difficulty of the work ahead. Dispensarization of the republic population will require the involvement of a significant number of additional physicians and mid-level medical personnel at a time when many medical establishments are experiencing a deficiency of them. So the search is on for the most rational and effective ways to resolve this task.

The real solution to the problem of covering the entire population with large-scale medical examinations, as we see it, is the use of computers and laboratory-diagnostic express methods which significantly reduce the consumption of human labor and increase the visitation capacity of medical establishments.

The Latvian Ministry of Health, jointly with associates of the Central Scientific-Research Laboratory, Pilsa Medical Institute have developed a simple method, available to every medical establishment, for preventative examination of the population using Iskra-1256 or Iskra-226 mini-computers. It will make it possible to uncover at a pre-medical stage the diseases which are most widespread among the population of the republic. This involves cardiology, rheumatology, diseases of the central and peripheral nervous system, endocrinology, nephrology and urology, gastroenterology, pulmonology, certain forms of oncological diseases, diabetes, and so forth.

A check of the effectiveness of the proposed methods verified their adequacy. In an average of 64 percent of the cases, the computer made a diagnosis which was confirmed by subsequent medical examination. This is because the machine's "logic" holds the broad knowledge of the republic's foremost physicians-scientists. Their "participation in absentia" significantly raises the quality of the preventative check-up itself.

Most often to be done in order to get from the computer a conclusion about one's state of health and find out whether it will be necessary to go to a physician, a cardiologist or a diabetologist, the patient carefully looks over 70 medical questions, and by a special computer table (mainframe of the familiar Iskra-1256 mini-computer) records the number of the questions for which the response is affirmative. Then the exam, on subjects blood and urine for laboratory analysis, measurement of viscosity of the blood serum, measurement of the vital capacity of the lungs, measurement of the arterial and intracranial pressure, the temperature and electrocardiogram are taken, and the pulse of the carotid and temporal arteries is assessed. In overall complexity, all this takes up about 40 min.

The results obtained by the course of such an examination are fed into a machine, which immediately indicates, if necessary, the appropriate type specialist and lists all symptoms of disease and deviation from the norm found in a laboratory-diagnostic examination. Of course, the specialist will not use just word information and should make his conclusive diagnosis, necessarily conducting a more thorough examination of the patient referred to him by the computer.

Calculations show that preventive examination of our republic's entire population done in this manner reduces the need for physician-specialists by a factor of 15, and for mid-level medical personnel by a factor of 1.5. The total number of medical examinations is reduced to almost one fifth compared to brigade-type examination because of the preliminary sifting out of practically-healthy persons, and because the remaining people are directed only to the specialist needed.

The republic has already accumulated practical experience in using this automated system of preventive examinations in Riga Polyclinic No 1, the medical-sanitary section of the VEF Production Association, and several other medical establishments.

This testifies to the fact that medical personnel of Soviet Latvia are close to solving the task of yearly dispensarization of the entire population. Use of computers makes it possible to conduct such examinations with high quality and simultaneously to reduce the patient's time loss to a minimum. But we must acknowledge that not everything is proceeding as we would like in achieving the goal which public health organs are pursuing. Experience has shown that a successful transition to universal preventive dispensarization of the population by July 1985 does not depend on medical personnel alone.

The managers of industrial enterprises, businesses, and establishments understand the importance of timely discovery of illness in workers and employees--that in the long run this will save society considerable resources, free them from temporary inability to work, reduce the expenses of treatment, and so forth. In not attaching the proper significance to preventive examinations, some administrators forget Article 50 of Latvian State law, concerning public health, which requires all managers to give all possible support to medical personnel in conducting their preventive and therapeutic work.

The statements of the June 1973 CPSU Central Committee Plenum point out that people's health is a matter of supreme importance. The promotion of successful completion of preventive examinations is the direct obligation not only of administration, but also all social organizations at every enterprise and in every labor collective.

At the same time, it is necessary for each every possible step to increase responsibility of our people for maintaining their health, which is a social duty. Only with the combined efforts of the republic's ministries and departments is guaranteed the population for the transition to universal dispensarization and hence to a successful realization of this nationwide task.

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JOINT WORK BY MOSCOW'S SCIENTIFIC RESEARCH INSTITUTE OF HYGIENE IMENI  
N. P. BIRDMAN AND PRACTICAL PUBLIC HEALTH ORGANS

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 83  
(manuscript received 11 May 82) pp 27-30

UBITSKOVA, A. P., GNOYEVAYA, V. L., KHAMIDULIN, R. S. and BRAUN, D. D.

[Abstract] A history of nutritional hygiene studies performed at the authors' institute is presented in brief. The institute is now undertaking combined practical studies of the actual nutrition and status of health of various age groups of the population in large territorial-production and fuel-energy complexes such as Noril'sk, the BAM rail line, the Kansk-Achinsk fuel and energy complex, etc. Scientific research performed during the 11th Five Year Plan will combine development of theoretical and methodological aspects of the individual effects of pesticides with specific introduction to the practice of preventive measures. Important work on hygienic evaluation of food products manufactured using new technological approaches such as sublimation drying, vacuum treatment, gamma irradiation and electron treatment of agricultural products is continuing. The provision of scientific consultation and organizational development work is another important aspect of the work of the institute.  
[67a-68a]

UDC 613.971:001.3"1981"

THE SCIENCE OF HYGIENE RESEARCH ON THE HYGIENE OF CHILDREN AND ADOLESCENTS

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 83  
(manuscript received 11 May 82) pp 31-35

BYKOVANOVA, M. I., ANAN'YEVA, N. A., BOKOTVASHNAYA, N. A., BORISOVA, L. A., ZAKHAROVA, V. M., KASABEK, V. Ye., KRAMARENKO, I. B., KRASHINSKINA, N. A. and TROITS'YEVA, G. V., Institute of Hygiene of Children and Adolescents, USSR Ministry of Health, Moscow

[Abstract] The authors' institute during the 11th Five Year Plan will continue to develop fundamental areas of medical science, giving particular attention to the study of the basic regularities of higher cerebral functions in man, studies

of the mechanism of creation of functional systems in post-natal ontogenesis, and the basic stages of purposeful behavioral acts. Fundamental studies have been performed at the Institute in the laboratory of the Physiology of Mental Work on evaluation of the functional status and integrative activity of the central nervous system of students during the course of a school year. At the crucial transition is made to teaching of children in school beginning at age 6, studies directed toward optimizing the conditions of teaching of 6-year-olds in general schools become more important. The 26th Party Congress called for a strengthening of physical culture and sports work among children. The Institute has developed various approaches to hygienic standardization of physical loads of various types for school children. Other studies have touched upon seasonal variations in accommodation of the eyes in response to variations in ultraviolet light, requirements for clothing for children during various seasons of the year and new techniques and equipment, including an infrared remote measurement device for producing heart rate recordings and EEG of 10 children simultaneously during class period. References 15 (Russian). [415-608]

UDC 613.95:001.8

# SCIENTIFIC STUDIES ON THE HYGIENE OF CHILDREN AND ADOLESCENTS TODAY

SVETLANA V. GABRIYAN I GABRIYAN in Russian No 4, Apr 93  
Manuscript received 17 Sep 92, pp 4-9

BOBOKH/MOKAYA, G. N., STAS, V. V. and PLJABNIKOVA, Z. A., Institute of Hygiene of Children and Adolescents, USSR Ministry of Health, Moscow

**Abstract.** The number of institutions working on the problem of the hygiene of children and adolescents has increased from year to year. In 1976 only 177 studies were performed at 54 institutions, whereas in 1981 the figures were 336 and 75. Three hundred and twenty scientific studies were completed in 1976-1981, the greatest number on the dynamics of the condition of juvenile health, with almost as many on the hygiene of working adolescents, somewhat less on the hygiene of school children. This article reviews some of the studies performed in 1981. Studies covered include changes in hygienic condition of students, the dynamics of working capacity of students in school and at home, the hygienic effectiveness of free time of students, the functional status of the system of students of various ages using mechanical teaching machines and other aspects of the influence of school life on the students. Studies of working adolescents have concentrated on the conditions and regimen of working in various production and technical premises. Studies in the area of prescriptive medicine have looked into the effectiveness of bacterias and certain types of treatment of certain cardiovascular and intestinal diseases, the concept of occupational malnutrition, individual specifics of autonomic regulation of the cardiovascular system in working girls, and other aspects of the relationship between work and study. Studies in the area of physical training and sports have dealt with the problem of hygienic standardization of physical loads and the limits of exercise programs and sports activities. A combined system has been suggested for evaluating the physical development of children evaluating the level of their functional development and the degree of their morphofunctional state. [11/8-036]



# SCOPE AND PATTERN OF ACTIVITIES OF SPECIALIZED MEDICAL EMERGENCY TEAMS IN MOSCOW

Moscow SOVETSKAYA MEDITSINA in Russian No 7, JUL 83  
(manuscript received 12 May 82) pp 79-81

ZHUTOVA, Ye. A., FEDOTOV, V. V., FAYNERBUN, O. D. and PERMYAKOV, M. K.,  
Scientific Research Institute of Medical Emergencies [Skoraya Pomoshch']  
Issled. V. V. Sklifovskiy, Moscow

**Abstract.** An analysis was made of the scope and patterns of activities of the specialized ambulance services (pediatric, cardiologic, OBSTYN, resuscitation, traumatologic, etc.) with a view toward more rational scheduling of their availabilities and services. At the present time Moscow has 76 such specialized ambulance teams and they account for 8.3% of all the calls received by the medical emergency service (skoraya pomoshch'). For optimum service, however, it appears that they should account for 11.26% of the cases seen at the medical emergency service, particularly in the area of pediatrics and OBSTYN. In the case of adults most (73.7%) of the specialized service is rendered by the intensive therapy and toxicologic teams. An analysis of seasonal and daily patterns of calls for service has shown that the availability of the specialized ambulance teams can be scheduled to meet peak demands and serve as reserve teams at other times. For example, most of the calls for the pediatric teams come on Saturdays, Sundays, and Wednesdays, while those for OBSTYN on Thursdays and Fridays.

(79-81) (73)

UDC 613.157.3-07

# THE METHOD OF DETERMINATION OF MOIST AND THE CONCENTRATION OF HARMFUL SUBSTANCES IN THE AIR OF THE WORKPLACE

Moscow ZDVIYENIE ZDRAVOOTSTROYENIYA in Russian No 5, May 82  
(manuscript received 23 Aug 82) pp 53-57

SAVITSKIY, V. V., All-Union Scientific Research Institute of Mine Rescue  
Moscow, USSR

**Abstract.** It is pointed out that the degree of harm done to a worker by harmful substances present in the air in the workplace is a function of the concentration of these substances in the air, the actual amount of air breathed by the worker per unit time, and the time of exposure. This article attempts to suggest a new method for calculating maximum permissible concentrations of harmful substances based on determination of the rate of respiration of the worker exposed to these substances. It is suggested that any attempt to determine MLC's by the use of some "standard" rate of exposure which fails to consider differences in respiration rate caused by the actual physical demands of work performed by the workers will lead to erroneous conclusions. Calling into question the actual pressure, temperature and humidity of the air in the workplace, rather than expressing concentrations and compared for any set of standard air conditions. References in (Russian).

(53-57) (75)

## MODERNIZATION OF MATERIAL AND TECHNICAL RESOURCES OF RURAL PUBLIC HEALTH INSTITUTIONS IN BELORUSSIAN SSR

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 8, Aug 83  
(manuscript received 1 Apr 83) pp 3-5

ZARIN, A. A., Chief, Department of Medical Resources Utilization, Belorussian SSR Ministry of Health

[Abstract] An analysis is presented of the resources of rural public health services in Belorussia in light of the expressed concern of the 26th CPSU Party Congress for the health and welfare of the Soviet people. The health needs of the rural population are currently being met by 458 uchastok hospitals with a mean bed capacity of 35.3 beds, 201 ambulatoria (staffed by physicians) and 3606 feldsher-midwife points. In addition, emergency services are rendered to the rural population at 111 central rayon and 24 rayon hospitals. It is obvious that to improve the health service and make it more accessible, the network of physician-staffed ambulatoria will have to be expanded and the bed capacity of the various hospitals increased. There is also an obvious need for modernization of equipment and supplies, construction of new hospitals and clinics to meet the demographic changes, and the use of standard architectural plans for the new health facilities. Success in the completion of these plans demands that all concerned parties exert their utmost efforts and show full cooperation in meeting the health needs of the rural workers in Belorussia.

Figures 1.

[717-17372]

UDC 576.8:628.513

## PROTECTIVE TECHNICAL COMPLEX FOR LABORATORY WORK WITH PATHOGENIC AGENTS

Minsk ZDRAVOOKHRANENIYE BELORUSSII No 8, Aug 83 (manuscript received 20 Oct 82)  
pp 3-5

LESTERACH, V. S., VOLYAKOV, V. I. and PIVCHENKO, A. G., Belorussian Scientific Research Institute of Epidemiology and Microbiology, Belorussian SSR Ministry of Health

[Abstract] A survey is presented of the essential features of a microbe-tight system for conducting laboratory work with pathogenic microorganisms. Coverage is given to the normal workflow for bacterial and viral agents with discussion of modifications of facilities for safe work with highly pathogenic or suspect agents. These include safety rooms with connecting passageways, special hoods and cabinets, isolated vivaria, autoclave room, refrigerated rooms, and the various forms and equipment for chemical and physical disinfection. Figures 1; references 3 (Western).

[717-17372]

## PROBLEMS WITH RURAL MEDICINE

Moscow PRAVDA 9 Sep 83 p 3

KOTEL'NIKOV, V., doctor of medical sciences, professor, Ryazan'

[Abstract] An extensive network of feldsher-midwife points exists throughout rural USSR. However, a great deal remains to be done to bring this system of medical points up to the level which is needed and, more importantly, quite possible. The medical points are frequently run down and in inconvenient locations in villages. One problem is that the equipment needed at these aid stations is manufactured in insufficient quantities and is very difficult to acquire. The Chernitovskiy medical point in Morshanskly Rayon, Tambov Oblast is cited as a model, well equipped and staffed by enthusiastic workers, with excellent results, including no cases of infant mortality in the past 20 years. Improvements in the rural medical system will require training of feldshers with more emphasis on surgery and midwives with more emphasis on pediatrics. LTV has also shown that the small uchastok hospitals of 10 to 15 beds are not justified either medically or economically. However, when these small hospitals are shut down, it is a mistake to completely close down medical services, transferring them all to distant larger hospitals. Medical points with feldsher-midwife assistants should be retained in place, provided with quick and reliable telephone communications with the rayon hospitals and allowed to serve as the first link in the chain of medical services to the rural population.

[162-402]

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INFLUENCE OF cAMP ACCUMULATION ACTIVATORS ON INDIVIDUAL GENOME EXPRESSION STAGES IN CELLS IN ACUTE RADIATION SICKNESS

REPORT 4. SPECIFICITY OF INHIBITION OF RNA SYNTHESIS IN ISOLATED CHROMATIN MATRIX BY INDIVIDUAL HISTONE FRACTIONS FROM NORMAL, IRRADIATED AND SEROTONIN-PROTECTED RAT LIVERS

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 2, Mar-Apr 83  
(manuscript received 28 Aug 81) pp 147-151

VAIKINA, L. A., TONKOVICH, B. A. and KICHEPENKO, N. Ye., Kiev State University named V. V. Shvchenko

[Abstract] A study is presented of the capability of individual histone fractions from nuclei of the livers of normal, irradiated and serotonin-protected rats to inhibit transcription of chromatin on the DNA matrix by E. coli RNA-polymerase. Five mg of each of the histone fractions studied was added to an molecular RNA synthesis system using isolated chromatin as the matrix. It was found that administration of serotonin two hours before sacrificing the animals had no significant influence on biological properties of the histone fractions studied. Irradiation, however, was an effective factor causing modification of the basic properties of the histones--their inhibiting activity. Irradiation apparently induces or inhibits one or more of the natural processes of modification of histones such as phosphorylation, acetylation and methylation. The radiation protectors tend to prevent these modifications or increase their intensity. Individual fluctuation in resistance to radiation of different histone fractions with and without the use of the radio protectors is said to be the most important observation of this work. Figure 1; references 17 in Russian, 7 Western.  
[770-2500]

# STUDY OF DNA SYNTHESIS UPON IRRADIATION AND SEROTONIN PROTECTION OF RAT LIVERS AFTER ELIMINATION OF CYCLOHEXIMIDE BLOCK

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(manuscript received 25 Mar 82) pp 157-160

ASHAMOVA, L. I., BLYUM, Ya. B., TRODZEVICH, B. A. and KUCHMENKO, N. Ye.,  
Biology Faculty, Kiev State University imeni T. G. Shevchenko

[Abstract] The cycloheximide block model is used to study the influence of radiation and a radiation protector (serotonin) on the dynamics of certain biochemical processes in the nucleus, particularly the process of DNA replication. Male white rats received a single cycloheximide dose of 0.2 mg per 100 g body mass in saline solution. The animals were exposed to whole body x-ray irradiation at the minimum lethal dose 6 hours after administration of the cycloheximide. Serotonin was administered intraperitoneally at 60 mg/kg body mass 5 minutes before irradiation to study the dynamics of DNA synthesis;

10  $\mu$ Ci of  $^3$ H-thymidine was administered at intervals after the cycloheximide. Two hours after the labeled compound was administered, the animals were decapitated and histones extracted from the liver cell chromatin. The remaining chromatin was subjected to acid hydrolysis with proteolysis inhibited by 5 mM sodium bisulfate in all stages. The DNA concentration was determined spectrophotometrically and radioactivity was determined on an SL-4000 "inter-technique" liquid scintillation spectrometer. The results indicated that the cycloheximide block model is quite interesting for the study of the mechanism of action of radiation and radiation protectors. The results lead to the conclusion that irradiation of proliferating hepatocytes in vivo in the early stages of the prereplicative phase greatly suppresses DNA synthesis. Serotonin significantly increases DNA synthesis and increases its level during subsequent x-ray irradiation. The radioprotective effect of serotonin in DNA replication is apparently related to the cAMP system, though the specific mechanism cannot yet be determined. Figure 1; references 12; 5 Russian, 7 Western.

# THE PROTECTIVE EFFECT OF SEROTONIN ON GOLDEN HAMSTERS FROM IONIZING RADIATION

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(manuscript received 25 Mar 82) pp 161-166

RAYKINA, T. A. and SVETLOVA, A. G., Leningrad Institute of Nuclear Physics  
Imeni P. L. Kapitshinov, USSR Academy of Sciences

[Abstract] Mature golden hamsters mass 90-130 g were irradiated in a gamma-neutron field in a vertical reactor channel and by x-rays. The total radiation dose was 2.5 and 4.0 Mr. 5-2- (2-aminopropylaminoethyl) thiophosphoric acid



(gammafos) was used as the radiation protector, administered intraperitoneally at 200 and 600 mg/kg 20 to 30 minutes before irradiation. The animals were placed in individual cages in a cold chamber for 1-2 and 4-6 weeks to achieve hibernation before irradiation, which was also performed cold (4.5°C). After irradiation the hamsters were either returned to the cold chamber or transferred to a warm room. The protection effect achieved by hibernation and that achieved by the radiation protector was found to be nonadditive, emphasizing the importance of the functional status of the organism for effective operation of radiation protection substances. Gammafos was found to have a radiation protective effect for neutron bombardment of hamsters, even though they are a species with relatively little intestinal radiation damage due to neutron bombardment. Figures 2; references 17: 5 Russian, 12 Western.  
[674-6508]

UDC 577.391:547.963

REPARATIVE AND REPLICATIVE DNA SYNTHESIS IN PROLIFERATING HEPATOCYTES IN EARLY STAGES OF X-RAY IRRADIATION AND WITH SEROTONIN PROTECTION

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR SERIYA B GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 5, May 83  
(manuscript received 30 Dec 82) pp 62-64

ASLAMOVA, L. I., BLYUM, Ya. B., TSUDEZEVICH, B. A. and KUCHERENKO, N. Ye.,  
Kiev State University

[Abstract] A cycloheximide (CH) block was used as a model to study DNA synthesis during irradiation and use of serotonin, a radioprotector. Cycloheximide was administered once, intraperitoneally, to male albino mice in a dose of 0.2 mg/100 g of body weight; 6 hr later the animals were subjected to a minimum lethal dose of X-irradiation (0.2 C/kg). Serotonin was administered intraperitoneally as serotonin creatine sulfate at the rate of 60 mg/kg 5 min before irradiation. DNA synthesis in proliferating hepatocytes was observed 6 hr after CH administration and reached peak values at 60 hr. Irradiation reduced the DNA peak by more than half and shifted it toward 72 hr. After administration of serotonin, DNA synthesis almost doubled in comparison with levels during the CH block, and this high level was maintained during subsequent irradiation. The higher DNA synthesis rate after irradiation with use of serotonin may be related to the serotonin-induced higher cAMP level, which determines cellular radiosensitivity. Use of hydroxyurea, which specifically inhibits replicative synthesis of DNA, revealed that DNA synthesis during irradiation was primarily reparative, whereas serotonin-induced DNA synthesis (peak at 60 hr) was primarily replicative. Figure 1; references 10: 4 Russian, 6 Western.  
[595-9307]

## MISCELLANEOUS

### PACIFIC OCEAN UNDERWATER RESEARCH

Moscow TEKHNIIKA I NAUKA in Russian No 8, Aug 83 p 9

[Unattributed article: "Mystery of the TINRO Basin"]

[Text] When the undersea craft of the USSR Academy of Sciences Institute of Oceanology began its dive in the region of the TINRO [Pacific Ocean Scientific-Research Institute of Fishing and Oceanography] Basin in the Okhotsk Sea, nothing hinted at any special surprises. The speed of movement was 5 m/min, the depth of the seafloor in this place, according to the echo sounder of the research craft Akademik Kurchatov, was 950 meters. The aquanauts observed the surrounding conditions through portholes; their sonar, working as an echo sounder, measured the diminishing distance to the bottom. It would be hard to say that the first half-kilometer of the descent turned up anything surprising: the plankton was of average density, fish were encountered from time to time, once a gigantic squid flashed by the porthole...But the plankton density suddenly increased and great schools of small sauries appeared. Just then the sonar indicated that the bottom was approaching. This was surprising. There were still 350 meters to the bottom, and here, at a depth of 600 meters, according to the instrument, was a distinct echo boundary...But the dive went on. When only 600 meters had been traveled, the water suddenly got turbid, and visibility through the porthole decreased from 10-12 to 2-3 meters. Living organisms disappeared, and the water began to resemble a suspension of 2-3 mm particles. The lower the diving apparatus descended, the thicker the murk became. And every 60-70 meters, the sonar gave false readings!

In reality, these were sudden increases in turbidity, creating the impression that below the aquanauts was a distinct echo boundary, the bottom. The basin turned out to be like a layer cake. Moreover, in passing through each layer, the researchers noted that the size of the suspended particles was sharply decreasing.

At a depth of 965 meters, the dive came to an end. The aquanauts felt no impact or jolt, as though the diving apparatus had settled into a fluid, dense mass. But the mud usually observed in such cases was not present. The surface of the bottom was not visible. The contours of the manipulators 30 cm from the porthole could barely be distinguished.

The aquanauts made an attempt to push the diving apparatus deeper using the motors which were placed vertically and thrusting downwards. A force of 300 kg had no effect; the apparatus remained in place.

The layered-mud broth in the TINRO Basin perplexed researchers. Hydrologists' data and the measurements made by hydrophysical probes showed that there were no appreciable shifts of temperature or electroconductivity in the region of the dive. That meant that there should have been no appreciable changes in density. This is also attested by the aquanauts' data on the dispersion rate of sound as a function of depth. In the deep-water portion, the curve was smooth, without abrupt changes. What was going on?

The aquanauts' visual observations and the water samples taken shed some light on the mystery of the TINRO Basin. The particles of the suspension forming the layer of increased turbidity in the basin come from an organic source. The basin and the Kamchatka and Northern shelves adjacent to it are extremely high-productive regions. Some 16.8-28.4 grams of organic material per square meter accumulate there in 24 hours.

And currents bring all of this natural suspension from the shelves into the basin. Over many millions of years, it has built up a layer of sediment 6 km deep--the deepest in the Okhotsk Sea. But if the basin holds so much organic matter, we must establish a deep-water fishing industry there as soon as possible! Alas, there's no use--the suspension particles clog the gills of fish, so in the turbid layers they simply don't exist.

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